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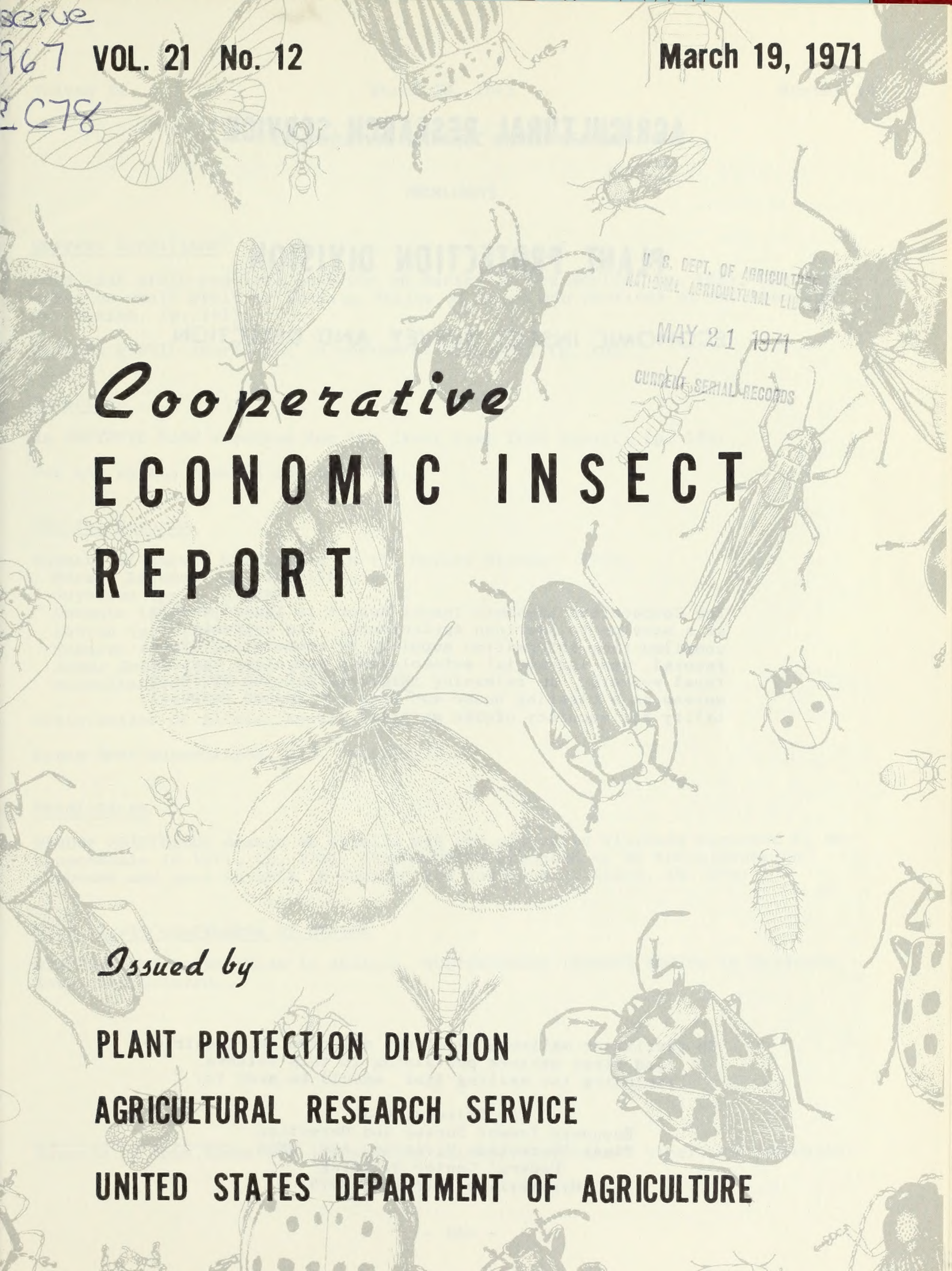

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Cooperative ECONOMIC INSECT REPORT

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PLANT PROTECTION DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PROTECTION DIVISION

ECONOMIC INSECT SURVEY AND DETECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 21 March 19, 1971 Number 12

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

CORN LEAF APHID required controls on barley in New Mexico. (p. 161). GREENBUG heavy on small grain in Rolling Plains of Texas and portions of Oklahoma and New Mexico. (p. 161).

ALFALFA WEEVIL increasing in southwest Arkansas. (p. 162).

Detection

An ENCYRTID WASP reported for the first time from Hawaii. (p. 165).

For new county records see page 165.

Special Reports

Summary of Insect Conditions in the United States - 1970.
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  Soybeans (pp. 176-178).
  Peanuts (pp. 178-179).
  Cotton (pp. 179-184).
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  Miscellaneous Field Crops (p. 184).

Distribution of Alfalfa Weevil. Map. (p. 168).

Gypsy Moth Quarantines. Map. Centerfold.

Predictions

MEADOW SPITTLEBUG damage on alfalfa and red clover in Illinois expected to be noneconomic in 1971. (p. 173). GRASSHOPPERS expected to be troublesome on soybeans and corn in 1971 in central and southern Illinois. (p. 178).

Some First Occurrences of Season

WESTERN TENT CATERPILLAR in Arizona. SUBTERRANEAN TERMITE adults in Delaware, Iowa, and Colorado.

Reports in this issue are for week ending March 12 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING MARCH 15

HIGHLIGHTS: Cool weather early in the week was followed by a gradual warmup with near record maximums at the weekend. Blizzards occurred in the North, thunderstorms and a few tornadoes in the South.

PRECIPITATION: Snow flurries and blustery wind lingered from the Great Lakes to New England early in the week on the back side of a storm as it moved off the coast to the Atlantic Ocean. Travel was difficult in some areas. Snow flurries dotted the northern Rocky Mountains. A deep low in the Gulf of Alaska moved toward the northern Pacific Coast. It brought wet and windy weather to the northwest. Winds at Cape Blanco, Oregon, gusted to 71 m.p.h. Wednesday afternoon. Rain fell along the coast and more snow accumulated in the nearby mountains. Bright sunny weather prevailed in the South at the beginning of the week, but a low developed and clouds and winds increased. Heavy thunderstorms broke out and hail pelted spots in Arkansas and Louisiana. At Deridder, Louisiana, winds gusted to 100 m.p.h. Tuesday evening. Wet and windy weather spread to the middle Mississippi and Ohio Valley regions. Snow fell from Iowa to Indiana late Tuesday, before spreading northeastward to already snowbound New York and New England. By noon Wednesday, seasonal snowfall at Syracuse, New York, had reached 141.8 inches, only 5 inches less than their alltime record seasonal total. By Thursday evening, Portland, Maine, had received 8 inches of new snow bringing their total for the season to 125.6 inches and setting a new seasonal record. Records at Portland began in 1881. Their previous seasonal record total was 119.1 inches of snow which fell in the 1933-34 season. A storm in the intermountain region caused rain along the northern and central Pacific coast Friday. Moving eastward, it brought snow flurries to the northern Rocky Mountains and northern Great Plains. Winds at Lander, Wyoming, gusted to 84 m.p.h. Saturday morning. Blowing dust occurred over the Plains in New Mexico and western Texas which were becoming very dry. Tornadoes occurred at a number of locations in southern Oklahoma and northeastern Texas. A tornado 26 miles west of Texarkana, Arkansas, killed 1 person, injured several, and destroyed numerous houses.

Weather of the week continued on page 184.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (Euxoa auxiliaris) - COLORADO - Surveys negative on wheat in Larimer and Weld Counties. Snow and cold weather kept populations inactive. (Johnson).

CORN LEAF APHID (Rhopalosiphum maidis) - NEW MEXICO - Controls needed on some barley in Luna and Hidalgo Counties. (N.M. Coop. Rpt.).

GREENBUG (Schizaphis graminum) - TEXAS - Heavy in Rolling Plains area. Infestations severe in some small grain in Baylor and Knox Counties. Controls applied to some small grain in Wichita and Wilbarger Counties. Greenbug noted in Foard, Hardeman, and Young Counties. Small grains growing well in northern area near Denton, Denton County. Populations decreased past month. (Boring, Turney). OKLAHOMA - Ranged 150-1,000 per linear foot of wheat in Washita and Roger Mills Counties; parasites active in most areas. Controls applied in some areas of Washita County. Range per linear foot of wheat: 50-125 in Jackson County, up to 300 in Tillman County, 0-100 in Kiowa County; heavy in some fields in Cotton County. Considerable spray applied, especially in Cotton County, and most fields in Frederick area of Tillman County sprayed. Ranged 20-25 per linear foot of wheat in Terral area, Jefferson County. (Okla. Coop. Sur.). NEW MEXICO - Generally light on barley, heavy in some fields, in Dexter, Hagerman, and Roswell areas of Chaves County. (Mathews). COLORADO - Survey negative on wheat in Larimer and Weld Counties. (Johnson). WASHINGTON - Very light in Benton and Franklin Counties. (Klostermeyer).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEW MEXICO - Generally light on alfalfa in Dexter, Hagerman, and Roswell areas of Chaves County. Heavier populations noted on some young alfalfa and controls required. (Mathews). OKLAHOMA - Ranged 20-150 per square foot of alfalfa in Davidson area of Tillman County. Averaged 250 per square foot in Davis area field, Murray County. Found in 2 of 3 fields in Bryan County (averaged 50 per square foot in one and 10 per linear foot in other, fall seeded field) and in 1 of 2 fields in Choctaw County (averaged 10 per square foot). None found in 6 fields in Johnston, Marshall, Murray, Garvin, and McClain Counties. (Okla. Coop. Sur.).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (Ostrinia nubilalis) - DELAWARE - No pupation of overwintering borers as of March 10. (Burbutis). MARYLAND - No pupation on Eastern Shore. (U. Md., Ent. Dept.).

SMALL GRAINS

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Ranged 300-500 per linear foot in most wheat in Cotton, Tillman, and Jackson Counties. Wheat continues very dry throughout area. (Okla. Coop. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - TEXAS - Specimens collected from burclover and yellow blossom clover in Lee, Fayette, Gonzales, Victoria, Refugio, San Patricio, Nueces, Jim Wells, Duval, and Atascosa Counties week ending March 5. Larvae and adults currently collected from same hosts in Trinity, Polk, Walker, and San Jacinto Counties. Also recovered from pecan trash samples in San Saba County. All are new county records. (Green, Anderson). Heavy on alfalfa in Erath and Burleson Counties. (Latham, Hoelscher). OKLAHOMA - Counts in 6 alfalfa fields in Johnston, Bryan, Marshall, and Choctaw Counties showed 40-100 percent of terminals infested with 1-7 larvae per terminal in most fields. Larvae very small to about two-thirds grown. Counts in 2 fields in Murray County averaged 52 percent of terminals infested with 1-5 larvae per terminal; in 2 fields in Garvin and McClain Counties infested terminals ranged 12-16 percent with 1-2 larvae per terminal. Alfalfa in these counties 2-5 inches tall. Damage to new growth ranged 50-90 percent in scattered fields in Bryan and Choctaw Counties, averaged fewer than 5 percent in most others. Adults found only in one field in Johnston County, single mating pair collected. McClain is a new county record. Larvae averaged 2 per linear foot in fall-seeded alfalfa in southern Bryan County. (Okla. Coop. Sur.). ARKANSAS - Alfalfa weevil continues to increase slowly and some economic infestations in southwest area. Some treatments applied. Cooler temperatures affecting materials used and some retreatment needed. (Barnes). MISSISSIPPI - Larvae per 20 stems of alfalfa by county: Marshall 37, Pontotoc 49, and Oktibbeha 27. (Sartor). KENTUCKY - Eggs averaged 159 per square foot in alfalfa in Fayette County. Count 5-7 times higher than for same period in 1970. (Barnett). MISSOURI - Average overwintering egg yield per square foot by county: Clark 4, Ralls 28, St. Charles 395, Ste. Genevieve 335, Cape Girardeau 198, New Madrid 142, Grundy 0, Macon 11.4, Boone 122.2, Laclede 74, Benton 0.8, and Greene 44. (Huggans, Hanning).

CLOVER LEAF WEEVIL (Hypera punctata) - CALIFORNIA - Averaged one adult per sweep in 20-acre alfalfa planting at Clovis, Fresno County. (Cal. Coop. Rpt.). NEW MEXICO - Averaged about one per square yard on alfalfa in Chaves County. (Mathews).

PEA APHID (Acyrthosiphon pisum) - NEW MEXICO - Light on forage legumes in Chaves, Eddy, and Dona Ana Counties. (N.M. Coop. Rpt.). OKLAHOMA - Light, up to 10 per square foot, in 5 of 12 alfalfa fields in Johnston, Bryan, Marshall, Murray, Garvin, Choctaw, and McClain Counties. (Okla. Coop. Sur.).

COWPEA APHID (Aphis craccivora) - OKLAHOMA - Ranged 1-3 per stem on occasional alfalfa plant in Davis area, Murray County. (Okla. Coop. Sur.).

DECIDUOUS FRUITS AND NUTS

ITALIAN PEAR SCALE (Epidiaspis leperii) - CALIFORNIA - Medium on apricot trees at Fremont and on walnut trees in Mission San Jose, Alameda County. (Cal. Coop. Rpt.).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Ranged 4-60 per limb on scattered almond trees at Orland, Glenn County. (Cal. Coop. Rpt.).

PUTNAM SCALE (Diaspidiotus ancylus) - CALIFORNIA - Infested walnut trees at Hamilton City, Glenn County. This is a new county record. (Cal. Coop. Rpt.).

SAN JOSE SCALE (Quadraspidiotus perniciosus) - CALIFORNIA - Counts of 20 per limb on escaped seedling almond trees and 2 per limb on cultivated almonds at Orland, Glenn County. (Cal. Coop. Rpt.).

CITRUS

Insect Situation in Florida - End of February - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 72 (norm 62) percent of groves; economic in 50 (norm 41) percent. Decreased but still above normal and in high range. Little change expected. Highest districts south, west, central, and north. CITRUS RED MITE (Panonychus citri) infested 53 (norm 37) percent of groves; economic in 18 (norm 14) percent. Population continues in low range although above normal for February. Increase expected late in March. Highest districts south and central. TEXAS CITRUS MITE (Eutetranychus banksi) infested 33 (norm 31) percent of groves; economic in 13 (norm 11) percent. Population near normal and low. Upward trend predicted for April. Highest district south. SIXSPOTTED MITE (Eotetranychus sexmaculatus) infested 7 (norm 7) percent of groves; economic in 1 (norm 1) percent. Gradual increase expected late in March. GLOVER SCALE (Lepidosaphes gloverii) infested 80 (norm 78) percent of groves; economic in 8 (norm 17) percent. At moderate level and slightly below normal abundance. Increase expected in April. Highest district south. PURPLE SCALE (L. beckii) infested 75 (norm 77) percent of groves; economic in 3 (norm 9) percent. At moderate level and slightly below normal abundance. Increase expected in April. Highest district north. CHAFF SCALE (Parlatoria pergandii) infested 54 (norm 9) percent of groves; economic in none (norm 9) percent. Population to continue below normal and low in all districts. YELLOW SCALE (Aonidiella citrina) infested 40 (norm 63) percent of groves; economic in 1 (norm 13) percent. Will remain low and below normal. Highest district east. An ARMORED SCALE (Unaspis citri) infested 30 percent of groves; none economic. Populations heavier than any prior month. Infestation intensified and will continue to increase. BLACK SCALE (Saissetia oleae) infested 17 (norm 33) percent of groves; economic in 6 (norm 14) percent. Population will remain below normal and very low in all districts through April. APHIDS began to appear in mid-March and will build up through April. Peak expected to occur later than average. Population predicted to be later and heavier in cold damaged groves. Adults of WHITEFLIES to appear on new foliage in late March and early April. Normal numbers expected, less than in 1969 and 1970. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

A PSYLLID (Psylla uncatoides) - CALIFORNIA - Specimens collected on orange, lemon, and tangerine trees by R. Sorgente at Orange, Orange County, on February 17. Determined by D. Byers, confirmed by R. Wilkey and D.D. Jensen. Adjacent Acacia street trees heavily infested. Eggs, nymphs, and adults noted on citrus trees, mainly on new growth. Much of this growth wilted and dead. Flower buds also damaged. Light infestation on commercial oranges about one-half mile from residential property. This is a new host record. (Cal. Coop. Rpt.).

CALIFORNIA RED SCALE (Aonidiella aurantii) - ARIZONA - Infestation found in nursery at Phoenix, Maricopa County, by D. Carver. Eradication measures applied. (Ariz. Coop. Sur.).

ORNAMENTALS

AN ADELGID (Adelges tsugae) - PENNSYLVANIA - Specimens collected from eastern hemlock at Bryn Mawr, Montgomery County, March 5. Previously collected in this county October 30, 1969, for first record in State.(Gesell). Collected in Delaware County July 16, 1970. (PPD).

WESTERN TENT CATERPILLAR (Malacosoma californicum fragile) - ARIZONA - Heavy in cottonwood tree at Phoenix, Maricopa County. (Ariz. Coop. Sur.).

MAN AND ANIMALS

SCREWWORM (Cochliomyia hominivorax) - One case reported in U.S. March 7-13: TEXAS - Hidalgo. Total of 40 laboratory-confirmed cases reported in portion of Barrier Zone in Republic of Mexico as follows: Sonora 15, Chihuahua 3, Tamaulipas 22. Total of 19 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screwworm flies released: Texas 17,618,000; Mexico 129,620,000. (Anim. Health Div.).

CATTLE GRUBS (Hypoderma spp.) - KENTUCKY - H. lineatum (common cattle grub) ranged 1-8 (averaged 4) per animal on backs of Holstein cattle of various ages in central areas. H. bovis (northern cattle grub) averaged 12.8 on backs of one herd of Hereford heifers in Fayette County. (Barnett). OKLAHOMA - H. lineatum ranged 0-7 (averaged 2 per head) on cattle in Payne County. (Okla. Coop. Sur.). COLORADO - H. lineatum averaged 8 grubs per animal on untreated cattle in Weld County on February 5. (Hantsbarger). UTAH - Hypoderma spp. grubs emerged from backs of cattle at Park Valley, Box Elder County. (Stenquist).

SHORTNOSED CATTLE LOUSE (Haematopinus eurysternus) - OKLAHOMA - Cattle lice, mainly this species, averaged 2 per hair part on cattle in Payne County. H. eurysternus continues moderate in Mayes County and light in Choctaw County. (Okla. Coop. Sur.).

NORTHERN FOWL MITE (Ornithonyssus sylviarum) - ARKANSAS - Still prevalent on caged layers in Washington County. (Simco).

HOUSEHOLDS AND STRUCTURES

SUBTERRANEAN TERMITES (*Reticulitermes* spp.) - DELAWARE - Swarming in New Castle County. (Burbutis). COLORADO - Adults swarming at Fort Collins, Larimer County, and at Denver, Denver County. (Hantsbarger). IOWA - *R. flavipes* (eastern subterranean termite) swarmed at Sioux City, Woodbury County, March 2. (Iowa Ins. Sur.).

STORED PRODUCTS

RICE WEEVIL (*Sitophilus oryzae*)- KENTUCKY - Adults averaged 2.9 per pound of wheat at one location in Woodford County. (Barnett).

BENEFICIAL INSECTS

A BRACONID (*Microctonus colesi*) - MARYLAND - Specimens collected at Germantown, Montgomery County, November 19, 1966, and at Cumberland, Allegany County, October 23, 1970, by W. Hollaway. Collected at Parkton, Baltimore County, by W.B. Bickley. Determined by W. Hollaway. Host material was *Hypera postica* (alfalfa weevil). These are new county records. (U. Md., Ent. Dept.).

A BRACONID (*Lysiphlebus testaceipes*) - OKLAHOMA - Adults and greenbug mummies very common in infested wheat in northern Washita and southern Roger Mills Counties. Parasitism 90+ percent in fields with previous counts of up to 1,000 greenbugs per linear foot. Parasites also active in northern Roger Mills County, only about 1 percent of aphids parasitized. Light activity also noted in volunteer wheat fields in southern Bryan County. (Okla. Coop. Sur.).

CONVERGENT LADY BEETLE (*Hippodamia convergens*) - OKLAHOMA - Adults up to 2 per square foot in scattered alfalfa in Johnston, Bryan, and Choctaw Counties. (Okla. Coop. Sur.).

A DAMSEL BUG (*Nabis* sp.) - OKLAHOMA - Ranged 0-1 per square foot in 1 of 2 alfalfa fields in Johnston County. (Okla. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Larvae collected from dooryard kumquats and loquats (Japanese plum) at North Miami, Dade County, March 4 (DeHaven); 2 adults (female) taken from McPhail trap in calamondin tree at Daytona Beach, Volusia County, March 5 (Pott). Adults trapped during February totalled 9,357. This is highest February count on record. (Fla. Coop. Sur.).

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - ARKANSAS - Specimens collected at oil well site along State Highway 29 in Lafayette County, March 5, 1971, by C. Williams. Determined by V.H. Owens, confirmed by D.R. Smith. This is a new county record. (PPD). NORTH CAROLINA - Swarming observed near Dothan, Columbus County, on February 18. Evidence of earlier swarming in area. Very little activity in Pamlico County. (Murray).

MEXICAN FRUIT FLY (*Anastrepha ludens*) - TEXAS - Trapped total of 76 adults as of March 12 in Hidalgo and Cameron Counties; 10 larvae taken from grapefruit in same area. Heaviest adult population in Rio Grande Valley in previous 5 years. Fruit cutting underway. (PPD).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 3/5-11, BL - Granulate cutworm (*Feltia subterranea*) 4. MISSISSIPPI - Stoneville, 3/5-11, 2BL, Temp. 29-69°F., precip. 0.69 - Armyworm (*Pseudaletia unipuncta*) 73, black cutworm (*Agrotis ipsilon*) 31, variegated cutworm (*Peridroma saucia*) 41. TEXAS - Waco, 3/5-11, BL - Armyworm 42, beet armyworm (*Spodoptera exigua*) 16, corn earworm (*Heliothis zea*) 2, granulate cutworm 10, saltmarsh caterpillar (*Estigmene acrea*) 2, variegated cutworm (*Peridroma saucia*) 63, yellowstriped armyworm (*S. ornithogalli*) 3.

HAWAII INSECT REPORT

New State Record - An ENCYRTID WASP (Aphycus mexicanus) emerged in heavy numbers from Ceroplastes cirripediformis (barnacle scale) found infesting fiddlewood (Citharexylum spinosum) at Hawaii Kai, Oahu, in November 1970 by K. Kawamura. Determined by B.D. Burks. (Kawamura).

Fruits and Nuts - CLOUDYWINGED WHITEFLY (Dialeurodes citrifolii) moderate in several acres of citrus at University of Hawaii experimental farm on Oahu during January. First found on Kusaie lime at Hilo, Hawaii, in March 1966. One specimen taken at Kailua, Oahu, by E. Shiroma in 1969 but not recorded. (Beardsley).

Forest and Shade Trees - An APHID (Cinara tujafilina) moderate on leaves (severe on 5 percent) of 100+ Thuja sp. in hedge planting at Waimea, Hawaii. (Kobayashi, Matayoshi).

Man and Animals - Trapped 425 VEXANS MOSQUITO (Aedes vexans nocturnus) and 4,183 SOUTHERN HOUSE MOSQUITO (Culex pipiens quinquefasciatus) in 55 light traps on Oahu during February. Aedes up to 100 per trap at Waianae and Culex up to 1,719 per trap at Kaneohe. (Mosq. Cont. Br. Dept. of Health).

Beneficial Insects - Examination of fruits and terminals of Melastoma malabathricum (Indian rhododendron) showed average infestations by MELASTOMA BORER (Selca brunella) of 14 and 16 percent, respectively, on Hawaii and Kauai. Surveys during January on same islands showed average infestations of 47 and 18 percent. (Yoshioka, Sugawa). A PUNCTUREVINE STEM WEEVIL (Microlarinus lypriformis) infested 55 percent of 69 internodes of Tribulus cistoides at Maalaea, Maui; negative at Kihei. (Miyahira).

Miscellaneous Pests - Nymphs of a GRASSHOPPER (Oedaleus abruptus) moderate in dry grassy areas at Barbers Point, Oahu. (Olson). Larval percentage on Oahu of random sampled koa haole branches by Semiothisa santaremaria (a geometrid moth) at Waimanalo 2, Barbers Point 44, and Schofield 36. Percent infestation by KOA HAOLE LOOPER (Anacamptodes fragilaria) on same host and at same locations 98, 56, and 64 respectively. Adults of these species increased in light traps on Oahu. Numerous moths near homes and shrubs at Koloa, Poipu, and Kukuiula, Kauai. (Au et al.).

DETECTION

New State Record - AN ENCYRTID WASP (Aphycus mexicanus) HAWAII - Oahu Island (p. 165).

New County Records - ALFALFA WEEVIL (Hypera postica) TEXAS - Lee, Fayette, Gonzales, Victoria, Refugio, San Patricio, Nueces, Jim Wells, Duval, Atascosa, Trinity, Polk, Walker, San Jacinto, and San Saba (p. 161); OKLAHOMA - McClain (p. 162). A BRACONID (Microctonus colesi) MARYLAND - Montgomery, Allegany, Baltimore (p. 164). IMPORTED FIRE ANT (Solenopsis saevissima richteri) ARKANSAS - Lafayette (p. 164). PUTNAM SCALE (Diaspidiotus ancylus) CALIFORNIA - Glenn (p. 162). SWEETCLOVER WEEVIL (Sitona cylindricollis) WYOMING - Washakie (p. 171).

CORRECTIONS

CEIR 20(43):739 - BLACK WIDOW SPIDER (Latrodectus mactans) - UTAH and NEVADA, should read A COMBFOOTED SPIDER (Latrodectus hesperus). Kaston, B.J. 1970. San Diego Soc. Nat. Hist. Trans. 16(3):33-82, July 24, 1970. L. mactans and L. variolus occur in the Eastern United States. Only L. hesperus occurs in the Western U.S. This correction also should be made on pages 677, 714, and 760 in Volume 20. (PPD).

CEIR 21(10):112 - HAWAII INSECT REPORT - Forest and Shade Trees - Line 10: "...95 percent probably Aphycus eruptor ..." should read "... 95 percent Aphycus mexicanus." (Kawamura).

(Continued from page 158)

FORAGE LEGUMES

Highlights:

ALFALFA WEEVIL populations were lower in some Northeast States due to the effect of several parasitic Hymenoptera released for its control. Damage was noneconomic for the third year in Maryland. Alfalfa weevil was the major pest of alfalfa in North Carolina and Missouri, and was economic for the first time in northwest Arkansas and north-central New Mexico. Populations decreased in some Central States but continued to spread in Michigan, North Dakota, Nebraska, Kansas, Oklahoma, Texas, and New Mexico. Damage was extensive in some Western States. Alfalfa weevil was reported for the first time from Florida, Minnesota, and Arizona. PEA APHID was the heaviest in three years on alfalfa in Maryland, but remained light in Virginia and noneconomic in Indiana, North Dakota, and Nebraska. Infestations were heavy in some Central and Western States. Larvae of several NOCTUID MOTHS caused some concern on alfalfa west of the Mississippi River.

ALFALFA WEEVIL (Hypera postica) apparently caused no damage in MAINE as none was reported nor was any found during surveys conducted in July or later. Populations in MASSACHUSETTS continued to decline, almost certainly due to parasitism by Bathyplectes curculionis (an ichneumon wasp) and Tetrastichus incertus (a eulophid wasp). Since parasite releases were greatest in Hampshire County, their effect was most pronounced in this area. The highest alfalfa weevil count for the county in 1970 was 101 per 100 sweeps as compared with 1,882 per 100 sweeps in 1965 (counts represent averages per 100 sweeps for several fields). In Berkshire County where parasite releases were fewer, the heaviest count was 1,408 larvae per 100 sweeps. The braconids Microctonus aethiops and M. colesi were recovered also, but distribution and abundance were not recorded. Alfalfa weevil populations in western and northern NEW YORK were heavier than in 1969. In the lower Hudson River Valley, however, weevil populations continued to decline as parasite populations increased throughout the State. T. incertus is now found wherever alfalfa weevil occurs in the State. B. curculionis is increasing rapidly and is more widespread than previously. M. aethiops is now well established in the southern tier of counties. These parasitic Hymenoptera and Hexamervis arvalis (a nematode) are exerting excellent control of alfalfa weevil in New York. Controls were required in a few widely scattered fields of alfalfa in PENNSYLVANIA to protect the first crop. This was an estimated 1-2 percent of the total acreage grown in the State in 1970. About 85-90 percent of the alfalfa acreage was harvested without sprays being applied, and only about 10-14 percent received controls on the stubble after the first crop was cut. Alfalfa weevil was of little significance in NEW JERSEY. The number of growers spraying their alfalfa has decreased from 94 percent in 1967 to 5.5 percent in 1970. Evidence indicates this decline is due to the activity of several parasitic wasps introduced for the control of this weevil.

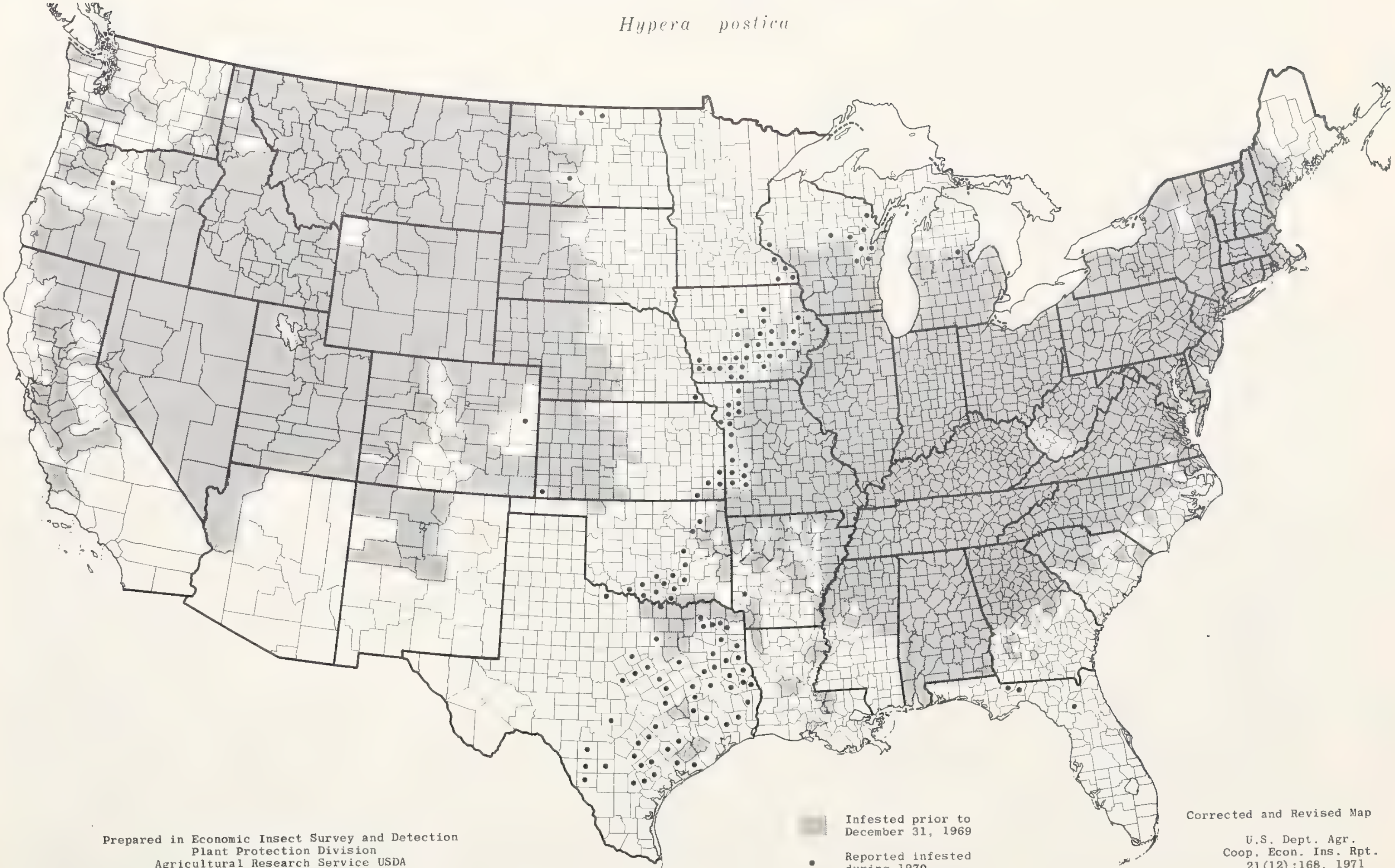
Alfalfa weevil larvae ranged 4-10 per sweep of alfalfa in DELAWARE with only light injury by mid-May. Egg hatch in MARYLAND was delayed two weeks due to an unseasonably cool April. First larval activity was observed the last week of April in Queen Annes and Dorchester Counties. Adults ranged 1-3 per 10 sweeps. Larval infestations seldom exceeded 3-20 per sweep. Pupation occurred in Frederick, Montgomery, and Harford Counties by May 22. Weevil activity in alfalfa phased out by June 29. Damage remained below economic levels for the third year in Maryland, and less than 10 percent of the growers applied controls. Populations in WEST VIRGINIA were heavy, but damage was light except in alfalfa that was cut late. Damage decreased in second-cutting alfalfa. In VIRGINIA, larvae first appeared in Charlotte, Powhatan, and Hanover Counties the first week of April. Severe damage was noticed in some southern Piedmont fields as early as April 21 when 1,600 early instars per 100 sweeps were detected in one Charlotte County field. Heavy infestations were common in Nottoway, New Kent, Amelia, Goochland, Prince George, Fluvanna, Powhatan, and Hanover Counties by May 5. Damage remained light to moderate in the mountain counties of Orange, Albemarle, Nelson, Shenandoah, Botetourt, and Montgomery. Larval counts were light in all but Orange and Frederick Counties the second week of June.

Alfalfa weevil continued to be the only major pest of alfalfa in NORTH CAROLINA and occurred in all areas of the State where alfalfa is grown. This pest was present in all fields of alfalfa in SOUTH CAROLINA, being especially noticeable in Anderson, Newberry, and Spartanburg Counties. Alfalfa weevil was collected for the first time in FLORIDA from alfalfa near Gainesville, Alachua County, in mid-March. Specimens were collected later from crimson clover and alfalfa in Gadsden and Leon Counties for new county records. Populations were light in these three areas. Alfalfa weevil was heavy on the 3,000 acres of alfalfa remaining in ALABAMA and controls were applied. This pest also damaged clovers, vetches, and other legumes in the State. Surveys during mid-March in the southern tier of counties in central and west TENNESSEE indicated little or no damage to alfalfa, although first and second instars were present in most fields and eggs were hatching. By April 10, up to third-stage larvae were feeding on terminals in all western counties with 10-15 percent of terminals showing injury. By late April many fields showed 25-30 percent terminal damage. During May, damage by H. postica increased sharply and 80 percent of the terminals showed feeding signs. Controls were applied in many areas and were effective. Damage decreased to below control levels by mid-June.

Alfalfa weevil is considered to occur statewide in ARKANSAS, although it has not been recorded from several counties due to the absence or low acreage of host plants. This pest was reported from Howard County for the first time in 1970. Eggs collected from alfalfa stems in Mississippi County during the winter of 1969-1970 indicated cold damage; however, there was a normal population of spring weevils. First collections were made in Lafayette County in mid-March; larval and adult counts ranged up to 800 (mostly larvae) per 100 sweeps. Populations were economic in the northwest area for the first time since 1966 when this pest became established in the area. Larvae per 100 sweeps ranged 6-10 in early April and 700-800 by late April. Infestations were later than normal in all areas due to a colder than normal winter and spring. Alfalfa weevil was the most serious pest of alfalfa in MISSOURI. The first larvae of the season were collected during the week of April 11. By April 25, larvae in the southeastern area ranged as high as 16 per sweep. By May 2, most of the untreated fields in the southern areas were severely defoliated. Larvae ranged 300-600 per 100 sweeps throughout the infested areas by May 26. Newly emerged adults caused damage in the central and northeast areas from mid-May to mid-June. Barton, Bates, Cass, Cedar, Clay, Clinton, Dade, Daviess, De Kalb, Harrison, Jackson, Platte, St. Clair, and Vernon Counties were infested for the first time during 1970. In IOWA, alfalfa weevil was found for the first time in Adair, Adams, Boone, Butler, Clarke, Decatur, Delaware, Grundy, Iowa, Jasper, Johnson, Keokuk, Linn, Madison, Mahaska, Marion, Marshall, Mills, Monroe, Montgomery, Polk, Pottawattamie, Poweshiek, Ringgold, Tama, Union, Warren, and Wright Counties. This weevil has been recorded from 49 counties in Iowa. Spring surveys in INDIANA indicated overwintered eggs ranged 5-30 per square foot, especially in the western third of the State. Two separate surveys also gave counts of 23-50 per square foot in the north-central, central, and south-central districts, and 16-45 per square foot in east-central and northeast districts. Egg counts varied widely and ranged up to 220 per square foot; the alfalfa weevil population from the latter count killed alfalfa by midsummer. Egg viability was believed lower than previous seasons by one-third to one-half. The larval peak was reached by May 4 in the southern districts with counts of 305 per 100 terminals. Proper harvesting would have kept losses to a minimum as feeding was not heavy a week after the peak was reached. The larval peak count was 185 per 100 terminals in the central district; this was 7-10 days later than peaks in the southern district. The peak count in the northern district was 270 larvae per 100 terminals by May 19, and this was an additional 7-10 days later than the other districts. Feeding damage in the central and northern districts appeared less severe than in the southern districts, partly because alfalfa was 3-5 inches taller when populations peaked. Heaviest damage occurred in the south-central district in 1969 and 1970, followed by the north-

Distribution of Alfalfa Weevil

Hypera postica



▨ Infested prior to December 31, 1969

● Reported infested during 1970

Prepared in Economic Insect Survey and Detection
Plant Protection Division
Agricultural Research Service USDA
December 31, 1970

Corrected and Revised Map

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
21(12):168, 1971

central and northeast districts. Alfalfa weevil populations were slower to build up in the eastern areas, but counts were heavier than in western Indiana. However, damage statewide was lighter this year. Bathyplectes curculionis (an ichneumon wasp) occupied a more important role in alfalfa weevil control than during 1969.

Alfalfa weevil egg deposition began April 10 at Wooster, OHIO. Egg counts continued to increase until May 15. Early instars were observed May 1. Damage in Ohio was confined to first-crop alfalfa and for all practical purposes had ended by mid-June. Damage estimates ranged 10-50 percent and peak larval feeding occurred during late May. Bathyplectes curculionis (an ichneumon wasp) was collected from alfalfa weevil larvae from mid-May to mid-October, and was present in 1-50 percent of the larvae. Tetrastichus incertus (an eulophid wasp) was reared from larvae for the first time on July 13. This wasp was found established in the northeastern corner of Ohio. Alfalfa weevil continued to spread in MICHIGAN. Damaging numbers were found as far north as Clare County. It was also reported from Gladwin and Arenac Counties. Control was generally very good because growers were aware of the pest and weather favored both early cutting and the application of chemical sprays. In many cases, properly timed cutting removed many eggs and larvae from the field without the aid of sprays. Alfalfa weevil was heavier than in the last 2 years and damage was moderate to heavy to alfalfa in the southern half of ILLINOIS. Damage occurred as far north as Henderson County. About 66,500 acres were treated. Peaks of up to 10,000 larvae per 100 sweeps were reached for Jackson County the first week of May in the southwestern area, which had the highest average counts all season. An average of 64.7 percent of the larvae were parasitized by Bathyplectes curculionis (an ichneumon wasp). This percentage is comparable with 1969's, except that alfalfa weevil numbers were heavier and more damaging this year. Damage in 1971 is expected to be moderate to severe south of a line from Watseka to Hardin, and light to moderate south of a line from Joliet to Monmouth and north of a line from Watseka to Hardin.

Alfalfa weevil adults were active in WISCONSIN about the first of May and some first instars could be found in folded leaflets of alfalfa. Some third instars were present in Kenosha County and pupation was underway by the end of May. Counts of 120 per 100 sweeps were taken in Kenosha County June 4. This was a decrease from 1969. Counts of 173 per 100 sweeps were taken in Rock County, an increase over 1969. Alfalfa weevil was found for the first time in MINNESOTA. Counts of 10 per 100 sweeps were found in an alfalfa field in Houston County May 19. This weevil was found also in Winona, Fillmore, and Wabasha Counties. No economic problems developed.

Alfalfa weevil counts decreased on irrigated alfalfa in McKenzie County, NORTH DAKOTA, compared with 1969. First and second instars ranged up to 46 per 100 sweeps during mid-June. No damage occurred this year. Collections were reported from the following new counties: Bottineau, Rollette, and Morton. Spread has been very slow since it was first detected in Stark County in 1955. Alfalfa weevil in the northern Black Hills of SOUTH DAKOTA was lower in 1970 than at similar periods in 1969. On June 3 there were 142 adults per 100 sweeps in 12-inch alfalfa. Although no larvae were obtained in the first few days of June, by June 10 there were up to 2,000 first and second instars per 100 sweeps. By late June, larvae averaged 3,440 per 100 net sweeps in uncut alfalfa, with up to 175 adults also present. In mid-July, counts in second-growth alfalfa 8-10 inches high averaged 146 larvae and 4 adults per 100 net sweeps. Populations in eastern Meade and Ziebach Counties were below economic levels in late June. Economic damage was confined to alfalfa in the northern Black Hills, but losses were small. Most alfalfa fields were cut before excessive damage occurred. Alfalfa weevil populations in NEBRASKA remained near or slightly below the levels of 1969. Larvae increased steadily in May and peaked June 4 when up to 1,085 per 100 sweeps were taken in western Dawson County. The highest count in the eastern part of the county was 56 per 100 sweeps. By June 17, pupation was well underway. None of the fields examined had economic numbers. The eastern part of Nebraska (Richardson County) was infested for the first time. Alfalfa weevil was not found in economic numbers in KANSAS. However, specimens were collected in 5 previously unreported counties: Montgomery, Neosho, Crawford, Bourbon, and Morton. The total known infested counties is now 45. Specimens were determined by H.L. Brooks. Late instars were found on alfalfa in Bryan and Choctaw Counties, OKLAHOMA, in early April. Damage was moderate in a few southeastern and south-central counties, but counts in most areas ranged 30 or less per 100 sweeps. Alfalfa weevil was reported from 14 new counties, many of which were in the south-central area. Weevil activity continued through mid-June. Alfalfa weevil infestations were heavy throughout the eastern half of TEXAS. Infestations were confirmed for the first time during 1970 in Anderson, Angelina, Bee, Bosque, Cherokee, Delta, Franklin, Goliad, Grimes, Guadalupe, Hardin, Harrison, Hopkins, Jackson, Jasper, Karnes, Leon, Liberty, Live Oak, Madison, Matagorda, Montgomery, Morris, Nacogdoches, Panola, Rusk, Sabine, San Augustine, Shelby, Titus, Upshur, Uvalde, and Wilson Counties. Alfalfa weevil continued to spread southward in NEW MEXICO. Infestations were found in southern Valencia County. Alfalfa weevil was a serious problem in Taos County for the first time. Adults collected from alfalfa in Mohave County, ARIZONA, in 1969 were reported in 1970 for the first record of this weevil in the State.

Alfalfa weevil adults became active in mid-April in Larimer, Weld, and Boulder Counties, COLORADO. Eggs were laid early in May and larval populations ranged 100-600 per 100 sweeps by the end of May. In the northeastern area, larval populations peaked at 150-1,000 per 100 sweeps by the second week in June. After the first cutting, populations declined, ranging 0-300 per 100 sweeps. Counts were heaviest in Boulder and Weld Counties where controls were used in many fields. Heaviest damage occurred in fields where first cutting was delayed. General losses in northeastern Colorado were light to moderate. Larval populations in the Arkansas Valley ranged 0-270 per 100 sweeps with some fields containing up to 3,500 per 100 sweeps during the last of May and the first two weeks of June. Heaviest populations, as in 1969, occurred in Pueblo, Crowley, and Otero Counties with lighter populations in other parts of the valley. Most larvae had pupated by mid-June. Another larval peak appeared in Pueblo, Crowley, and Otero Counties during August and ranged 0-400 per 100 sweeps with damage in many fields. Cocoons of Bathyplectes curculionis (an ichneumon wasp) were examined for hyperparasitism; no evidence appeared. Alfalfa weevil damage in UTAH was extensive and would have been more serious, except that spring rains and cool conditions retarded development. Inclement weather occassionally made controls difficult. Alfalfa weevil populations were below those of 1969 in WYOMING. Adults were first active April 21 in Hot Springs County. Larvae began appearing in Washakie and Big Horn Counties in late May, ranging up to 500 per 10 sweeps in late June in Big Horn County. In most areas alfalfa outgrew the larvae and damage was light. Alfalfa weevil adults and larvae were first active in IDAHO May 21 on alfalfa in Idaho County. The first egg cluster was found May 11 near Aberdeen, Bingham County; 18 egg clusters per 50 stems were found by May 25. There were 48 adults per 50 sweeps near Aberdeen on May 26. Larvae reached a population peak and the first pupa was found June 22 at Aberdeen. Pupal counts peaked July 2-6; the last egg was found July 6 and the last larvae July 27. There was a large amount of damage, unestimated as to value, to the alfalfa crop in Idaho during 1970. Much of this damage would have been prevented had alfalfa been cut early. Near Preston, Franklin County, first and second instars caused 40 percent damage to irrigated alfalfa, but only 1-5 percent on upland, dryland alfalfa. By June 10, twenty percent of alfalfa tips were injured near Hansen, Cassia County. Damage was 25 percent on June 11 and 60 percent on June 15 near Kimberly, Twin Falls County. Ninety percent of the tips were damaged near Aberdeen by June 17.

Alfalfa weevil infestations in WASHINGTON were spotty at Ellenburg, Kittitas County. Larvae ranged 2-3 per sweep in alfalfa seed fields in Walla Walla County. Damage ranged moderate to serious on dryland alfalfa near Pullman, Whitman County. Alfalfa weevil remained light in the Willamette Valley of OREGON, and no new infested counties were found. Populations increased in Jefferson County; however, no economic damage occurred, although some fields were treated for the first time. Populations continued to expand throughout Crook County, and 5,000 to 10,000 acres were treated. This was unnecessary 3 to 5 years ago. Populations were heavier and for a longer period than in previous years. Considerable damage occurred in untreated Klamath County fields, but it was less than in 1969 due to the earlier cutting of the first crop. Alfalfa weevil and EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) were widespread and damaging to alfalfa in CALIFORNIA. Infestations started in February and were still a problem in some locations in September. Alfalfa weevil egg deposition began in NEVADA in late March. Cold, damp weather staggered and prolonged hatching and affected larval development. This influenced timing of treatments and many fields required a second treatment. Most chemical controls were applied in early June with some in late May. Larvae peaked with 240+ per sweep and damage was noted near mid-June.

CLOVER LEAF WEEVIL (Hypera punctata) larvae were most common in alfalfa in south-central and southeastern WISCONSIN and complicated evaluation of H. postica (alfalfa weevil) populations. Clover leaf weevil and alfalfa weevil larvae occurred in a ratio of 3:1. Clover leaf weevil larvae ranged first to third instar during late April. Counts were relatively low throughout the season, although adults were fairly common in alfalfa in mid-October in Marathon, Clark, Lincoln, and Langlade Counties. Clover leaf weevil caused no economic damage in WEST VIRGINIA this year. Clover leaf weevil populations in OKLAHOMA were moderate to heavy on alfalfa in most southwestern and west-central counties during late April and early May. In NEW MEXICO, larval counts were about 3 per square foot in several alfalfa fields at Dexter and Hagerman, Chaves County, during April. Specimens were found in southern Rio Arriba County for the first time this year.

LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) was reported for the first time in FLORIDA, where it was common on crimson clover at Quincy, Gadsden County, and at Tallahassee, Leon County, during April. Population counts ranged 1-11 per 100 sweeps and were not economic in WEST VIRGINIA.

CLOVER HEAD WEEVIL (Hypera meles) was reported for the first time in FLORIDA. Populations were light on crimson clover at Quincy, Gadsden County, and at Tallahassee, Leon County, during April. Clover head weevil continues to be a serious pest to seed production of crimson clover in central ALABAMA. Controls were applied 1-2 times to 3,000+ acres in this area.

SWEETCLOVER WEEVIL (Sitona cylindricollis) was collected on alfalfa in Washakie County, WYOMING, by A.E. Parshall May 8, 1969, and determined by R. E. Warner. This is a new county record. Sweetclover weevil occurred throughout UTAH, and damage was moderate this year. A WEEVIL (Pantomorus taeniatulus) was heavy in seed of sericea lespedeza in Union County, SOUTH CAROLINA. This was the first report of this weevil from this host plant, as well as the first records for Union County and the Piedmont. During September, adults were exceedingly numerous on lawns in Richland County.

VETCH BRUCHID (Bruchus brachialis) was moderate on vetch in Love, Stephens, and Kay Counties, OKLAHOMA, from mid to late May. A SAP BEETLE (Meligethes nigrescens) was economic in some crimson clover fields in Washington and Yamhill Counties, OREGON, in July and controls were necessary.

PEA APHID (Acyrthosiphon pisum) remained light in NEW YORK as biological control agents continued to suppress numbers. This aphid was heavy on some alfalfa during early May in DELAWARE. Populations in MARYLAND were considered to be the heaviest in the past 3 years, but only slightly increased over 1969. Infestations were spotty and ranged 5-30 per sweep in June. By early July, heaviest counts ranged 60-200 per sweep of alfalfa. Timely cuttings and late summer predation and parasitism brought most of the moderate infestations under control in late August and early September. Pea aphid was first reported April 20 in Montgomery County, VIRGINIA. Counts were light in Botetourt, Page, and Frederick Counties April 23, and ranged 30-50 per 100 sweeps by the first week of May in Franklin, Mecklenburg, Campbell, and Nottoway Counties. Populations remained light throughout the State and caused little or no economic damage. Pea aphid populations were moderate to heavy on alfalfa in TENNESSEE from mid-March through June. The amount of damage caused by this pest was not assessed.

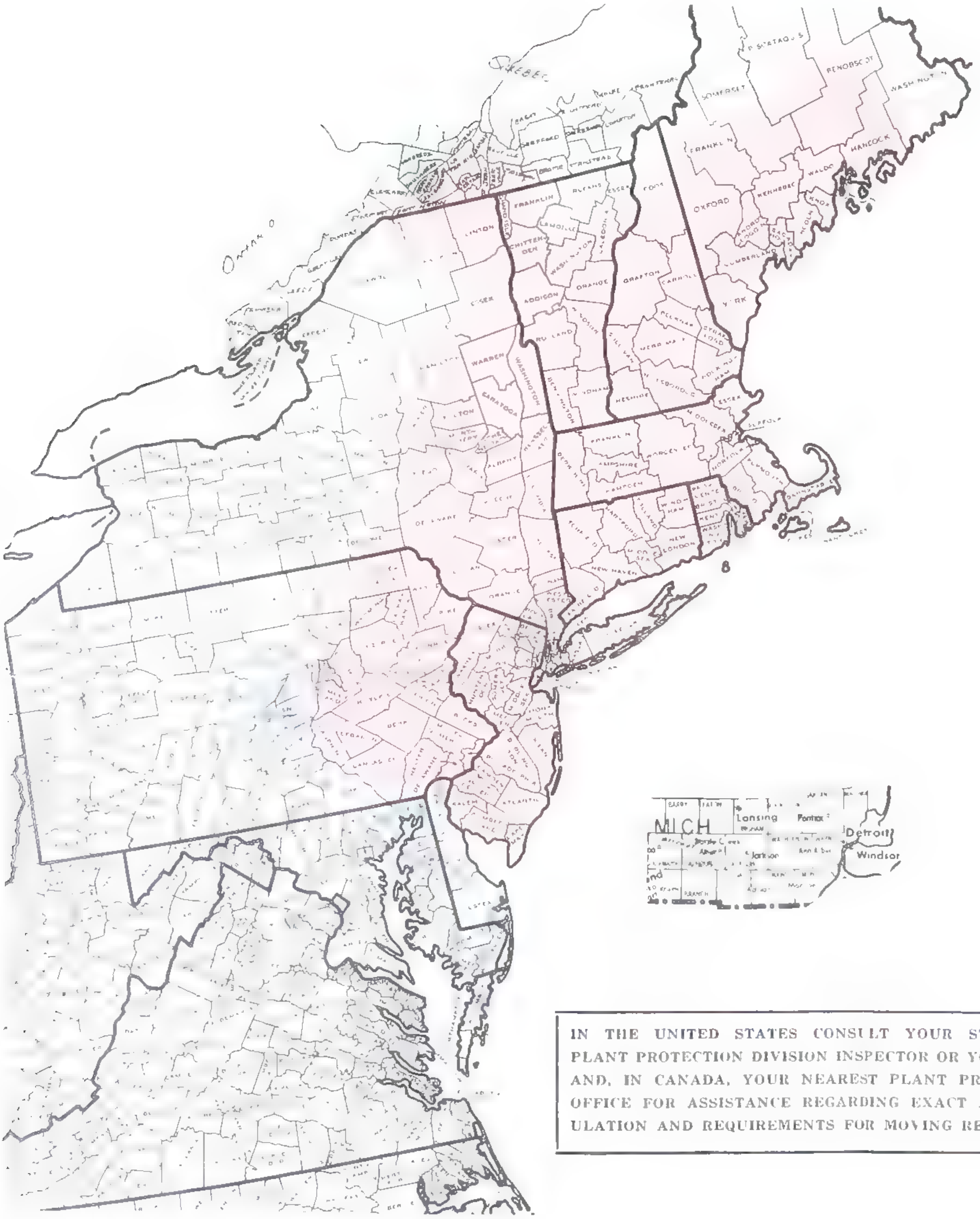
Pea aphid built up on alfalfa in early May in OHIO. Populations were present and fairly constant throughout the summer. Highest populations, 12 per sweep, occurred in the northeast area during August. Pea aphid generally is most abundant early in the season in MICHIGAN. However, this pest did not appear in 1970 until after the first cutting of alfalfa. Damaging levels were not reached. In INDIANA, populations were generally noneconomic in alfalfa in 1969 and 1970. Counts per 100 sweeps averaged 288 by August 19 in the southern area, 209 by August 26 in the central area, and 855 by September 2 in the northern area. The higher figure in the northern area was due to fairly consistent high counts in the northeast district throughout the season. Pea aphid in ILLINOIS was extremely abundant on alfalfa although it caused no serious damage. Numbers peaked in early May with up to 10,000 per 100 sweeps in the southern one-third of the State. About 3,400 acres were treated. Pea aphid egg hatch started about April 16 in WISCONSIN, about a week later than in 1969. Populations were low initially. Winged forms began appearing early (May 1) and comprised a large percentage of the population by the end of May. Migrations to alfalfa and peas began immediately. Populations increased despite parasitism and predations, and ranged up to several hundred per sweep in late June and mid-July. There was some difficulty in hay baling operations reported due to the prevalence of this pest. The population collapsed late in July and remained low the rest of the season.

Pea aphid appeared in economic numbers of 100 per growing tip on alfalfa in mid-August in Pembina County, NORTH DAKOTA. Populations in southeastern SOUTH DAKOTA were much below the heavy numbers of 1969. At the end of May there were 2-4 aphids per sweep in Lincoln, Clay, Davison, Minnehaha, Moody, and Brookings Counties. Predators, primarily Coccinellidae, were also high in numbers with 1-2 per sweep. Pea aphid was not economic on alfalfa in NEBRASKA, due to the rapid buildup of natural enemies. The heaviest counts, up to 40 per sweep, were found in Saunders County in mid-May. Up to 200 lady beetle larvae per 100 sweeps were present in most fields in Dawson County on June 16. Pea aphid peaked on alfalfa in May and then began to decline. Some vetch was damaged in Stanton County the last week of May. A short-lived resurgence of pea aphid on Dawson County alfalfa during late August and early September did not reach economic proportions. Pea aphid ranged 0-15 per 10 sweeps of alfalfa in southeastern MISSOURI by late March, and increased to 100 per 10 sweeps by late April. Populations ranged 400-700 per 10 sweeps in the southwestern and central areas. Stunted and yellowed alfalfa occurred throughout the southwestern area. By mid-May, populations declined due to chemical controls and disease. In KANSAS, alfalfa was damaged in Meade, Clark, Comanche, Edwards, and Pawnee Counties in mid-April. Pea aphid counts of 500-1,500 per 25 sweeps were reported in alfalfa in Elk, Sedgwick, Cowley, and Sumner Counties in early May with significant populations of predators and parasites. In the eastern two-thirds of Kansas, pea aphid generally ranged 200-600 per 10 sweeps by late May, and predators and parasites were generally very abundant. No pea aphid damage was reported during late May or later. An estimated 8,800 acres of alfalfa were treated in Gray, Rice, and Kingman Counties. Populations in OKLAHOMA were heavy on alfalfa in the north-central and northwestern areas in mid-March. By the end of April, pea aphid ranged moderate to very heavy in all areas. Chemical controls and moderate to heavy parasitism caused a rapid decrease in most areas during May, but pea aphid continued moderate to heavy into mid-June in Mayes, Payne, Harmon, Murray, and Jefferson Counties. Numbers were generally light to absent statewide the remainder of the year.

Pea aphid populations varied widely in COLORADO throughout Prowers, Bent, Otero, Crowley, and Pueblo Counties. Counts ranged 150-9,000 per 100 sweeps of alfalfa early in June, but populations declined as the season progressed. There were only isolated fields showing any stunting and yellowing. Heavy populations of pea aphid caused heavy damage in Fremont, Custer, and Huerfano Counties early in May. In northeastern Colorado, numbers peaked at 2,000-15,000 per 100 sweeps of alfalfa by the end of June, but declined after the first cutting. Pea aphid populations in WYOMING remained about the same in 1970 as in 1969. This aphid began appearing in mid-June in Washakie, Big Horn, and Hot Springs Counties. Counts peaked in mid-August and declined thereafter. Population counts were

GYPSY MOTH QUARANTINES

U S DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PROTECTION DIVISION
AND CANADA DEPARTMENT OF AGRICULTURE
COOPERATING WITH AFFECTED STATES



IN THE UNITED STATES CONSULT YOUR STATE OR FEDERAL PLANT PROTECTION DIVISION INSPECTOR OR YOUR COUNTY AGENT AND, IN CANADA, YOUR NEAREST PLANT PROTECTION DIVISION OFFICE FOR ASSISTANCE REGARDING EXACT AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES

COUNTIES ENTIRELY COLORED ARE COMPLETELY REGULATED
COUNTIES PARTIALLY COLORED ARE PARTIALLY REGULATED

🟥 GENERALLY INFESTED AREA-STATE, FEDERAL AND CANADIAN REGULATIONS
(ERADICATION TREATMENTS NOT IN PROGRESS OR PLANNED)

🟩 SUPPRESSIVE AREA STATE, FEDERAL AND CANADIAN REGULATIONS
(SUPPRESSIVE TREATMENTS IN PROGRESS OR PLANNED)

🟦 STATE REGULATIONS ONLY
(SUPPRESSIVE TREATMENTS PLANNED WHERE NECESSARY)

⬜ ERADICATED—REGULATIONS REMOVED

SEE REVERSE SIDE FOR LIST OF REGULATED ARTICLES

RESTRICTIONS ARE IMPOSED ON MOVEMENT OF REGULATED ARTICLES FROM A REGULATED AREA AS FOLLOWS

1. FROM RED INTO OR THROUGH GREEN, BLUE, OR WHITE
2. FROM GREEN INTO OR THROUGH WHITE OR BLUE
3. GREEN INTO GREEN
4. WITHIN GREEN *
5. FROM BLUE INTO ANY OTHER AREA **

*IF REQUIRED BY AN AUTHORIZED INSPECTOR

**IF REQUIRED BY APPROPRIATE STATE QUARANTINE OR BY AN AUTHORIZED INSPECTOR

REVISED JANUARY 8, 1971

THE FOLLOWING REGULATED ARTICLES MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED

1. Trees, shrubs with persistent woody stems, and parts thereof, **except** seeds, fruits, and cones.

   Trees and shrubs, and parts thereof, are exempt if grown in a greenhouse throughout the year and so labeled on the outside of each container.*

   Boughs, cuttings, and scions with stems no greater than one-half inch in diameter are exempt.*

   Parts of trees and shrubs that have been dried, pressed, waxed, lacquered, varnished, or similarly surface-treated, are exempt.*

2. Timber and timber products, including but not limited to lumber, planks, poles, logs, cordwood, and pulpwood.

   Lumber is exempt if dressed or sawed four sides with ends clipped and free of surface bark, or if kiln dried, provided such lumber is shipped direct after processing and the waybill or other shipping document is marked to show that the lumber was shipped immediately after processing.*

   Manufactured wood products, such as shingles, flooring, furniture, handles, etc., are exempt.*

   Shavings, sawdust, wood flour, excelsior, and cedar bedding are exempt.*

3. Stone and quarry products.

   Stone and quarry products are exempt if processed by grinding or pulverizing.*

4. Trailers of all types, including mobile homes, when the person in possession thereof has been so notified by an inspector.

*Exempt if not exposed to infestation after the prescribed handling.

heaviest in Platte, Fremont, and Washakie Counties in Wyoming. Some fields were treated in Platte and Fremont Counties. Pea aphid mummies resulting from parasitism by Aphidius pulcher (a braconid) were general and heavy in a few areas of IDAHO. Beneficial insects were present in alfalfa hay statewide. Pea aphid infestations in NEVADA required the usual control on seed alfalfa beginning in late June and continuing through August in Churchill, Humboldt, Lander, Pershing, and Washoe Counties. Economic numbers required control on alfalfa hay in Clark and southern Nye Counties in late March and April. In these areas, pea aphid in untreated fields was effectively controlled by predators and parasites. Damage ranged light to moderate on alfalfa in UTAH. The fall buildup was less than normal, but controls were required on a few thousand acres. Pea aphid populations in ARIZONA were moderate to heavy from mid-December 1969 through June 1970 on alfalfa in Yuma County.

MEADOW SPITTLEBUG (Philaenus spumarius) eggs began hatching on April 24, one day earlier than in 1969, in WISCONSIN. Populations in some individual fields were heavy. The statewide population appeared to be lower than in previous years. Immatures of meadow spittlebug in INDIANA approached 5 per 100 terminals by April 14 in the southern district. Peak nymphal averages by district during May were as follows: South 18.5, central 12.3, and north 19.2. There was a rapid decrease of nymphs followed by heavy adult counts in alfalfa by June 1. In some fields adults averaged 3,900 per 100 sweeps. By mid-August, the average was 66 per 100 sweeps in the southern district; 7 days later the average was 209 in the central district. By the first of September, counts averaged 155 per 100 sweeps in the northern district. Meadow spittlebug on alfalfa and red clover in ILLINOIS was slightly higher this year than in 1969 with a State average of 1.4 adults per sweep compared with 0.9 adult per sweep in 1969. The highest counts were reached in the northeastern and northwestern areas with an average of 1.7 per sweep and 1.8 per sweep, respectively. Control measures were seldom needed, although 350 acres were treated, and damage in 1971 is expected to be noneconomic. First nymphs of meadow spittlebug in MARYLAND appeared in red clover the first week in May, and averaged 1 per square foot in Frederick, Montgomery, Howard, and Carroll Counties. Populations peaked above those of 1969, with heaviest mid-May counts of 8-15 spittle masses per square foot in alfalfa and red clover. Fourth instars ranged 10-15 per sweep of alfalfa in late May in Frederick, Carroll, Baltimore, and Prince Georges Counties. Adults were active by June 12 in alfalfa and red clover statewide. Good growth conditions during spring allowed alfalfa and red clover to outgrow much of earlier damage. Very little hay acreage was sprayed in Maryland. Meadow spittlebug populations were low in all areas of WEST VIRGINIA. There was damage to alfalfa and clover, but no dollar assessment was made.

TARNISHED PLANT BUG (Lygus lineolaris) counts per sweep in MAINE were up to 8 on alfalfa and 10 on hay in July. Adults averaged 10 per sweep on alfalfa and 4 on hay with light damage during August. Tarnished plant bug adults averaged 25 per 100 sweeps in the southern two-thirds of INDIANA in alfalfa by mid-May. All stages averaged 228 per 100 sweeps with 67 percent nymphs in the southern district. Populations were heaviest in the south-central district. Populations averaged 100 per 100 sweeps in the central district, and 24 percent were nymphs. In the northern area, populations averaged 82 per 100 sweeps (131 in northeast) and 40 percent were immatures. Infestations were somewhat below those of 1969. Tarnished plant bug caused no economic damage in VIRGINIA. Adults were light in Botetourt, Page, Frederick, Albemarle, Orange, Nelson, Franklin, Campbell, Nottoway, Montgomery, Goochland, and Louisa Counties. Tarnished plant bug activity in OKLAHOMA began on Mayes County alfalfa in late March. Counts were light to moderate in most areas throughout the season.

LYGUS BUGS (Lygus spp.) were near normal in alfalfa seed producing areas of Churchill, Humboldt, Lander, Pershing, and Washoe Counties, NEVADA. Control was difficult in some instances. Lygus bugs ranged 350-1,400 per 100 sweeps in most alfalfa in Yuma County, ARIZONA, from mid-March through September. L. elisus, L. hesperus, and Lygus spp. caused nearly normal injury to the alfalfa seed crop in UTAH. Populations were below normal in Millard County alfalfa to midsummer.

Lygus bugs in COLORADO ranged 0-1,200 per 100 sweeps with most fields containing less than 300. Controls were used only in alfalfa seed fields. Lygus bugs were noneconomic in WYOMING and nearly normal in southern IDAHO. Control was required on most seed crops in Idaho, but was not difficult to maintain. Nearly all alfalfa seed fields were treated. Lygus bugs were common on legumes in greater numbers than in recent years in NEW YORK, particularly tarnished plant bug which caused much injury to birdsfoot trefoil grown for seed.

Adelphocoris spp. were generally heavier than normal in most WISCONSIN alfalfa, particularly ALFALFA PLANT BUG (*A. lineolatus*). Nymphs of this species and RAPID PLANT BUG (*A. rapidus*) were first noted May 8 and adults were observed June 1. Alfalfa plant bug was the predominant species in alfalfa and averaged 30 per sweep in some areas. Alfalfa plant bug was heaviest in the northern districts of INDIANA, averaging 223 per 100 sweeps by September 2 (474 per 100 sweeps in northwest); 38 percent were nymphs. Counts were 87 per 100 sweeps in central districts; 57 percent were immature 7 days earlier. By mid-August, populations averaged 67 per 100 sweeps in the southern counties and 67 percent were immatures. Rapid plant bug was the least important plant bug in Indiana. Counts averaged 38, 33, and 26 per 100 sweeps in the southern, central, and northern districts, respectively, during late August. SUPERB PLANT BUG (*A. superbus*) was common but generally very light on seed alfalfa in UTAH.

RICE STINK BUG (*Oebalus pugnax*) adults averaged 0.5 per 10 sweeps in red clover in Johnson County, KANSAS, in mid-November. This was a new county record. SAY STINK BUG (*Chlorochroa sayi*) caused light, local damage to alfalfa for seed in UTAH.

ALFALFA CATERPILLAR (*Colias eurytheme*) was more prevalent this year on alfalfa than during 1969 in CALIFORNIA. Larval populations were heavy and damaged alfalfa hay in Clark County, NEVADA, in late August and September. Alfalfa caterpillar population levels remained light from March through late June in ARIZONA. Heaviest populations occurred in alfalfa during late July through early October in Yuma Valley, Gila Valley, Dome Valley, and Blaisdell areas of Yuma County, and the Salt River Valley, Casa Grande, and Coolidge areas of Maricopa and Pinal Counties. Heavy moth flights were not as widespread in alfalfa as in prior years. Heaviest flight occurred in Yuma County in early July. Larval populations of 40 per 100 sweeps occurred in Yuma County from late October through mid-December. Alfalfa caterpillar and PALESTRIPED FLEA BEETLE (*Systena blanda*) were present in many fields during summer in COLORADO but were never a serious problem. Larvae averaged 9 per 100 sweeps throughout INDIANA in August but were not a problem. No economic damage was attributed to alfalfa caterpillar in VIRGINIA.

GREEN CLOVERWORM (*Plathypena scabra*) reached threatening proportions in some fields of second cutting alfalfa in central MICHIGAN, but damaging populations did not occur. Counts were reduced in later cuttings. Moths began appearing in WISCONSIN in moderate numbers in blacklight traps at Platteville, Grant County, at Mazomanie, Dane County, and at Hancock, Waushara County, during mid-July. Larvae were prevalent in alfalfa by mid-August. Heaviest counts apparently were in western Wisconsin in alfalfa and soybeans, ranging 1-3 per sweep in alfalfa and 2 per linear foot of row in soybeans. Green cloverworm was not too important in INDIANA alfalfa. Larvae averaged 19, 52, and 14 per 100 sweeps in the southern, central, and northern areas, respectively. Populations were heaviest in western areas. Larvae were present in most WEST VIRGINIA fields but no economic damage could be attributed to green cloverworm. Green cloverworm started on alfalfa in Alfalfa County, OKLAHOMA, in early April. Populations were heavy in Kiowa, Jackson, Tillman, and Stephens Counties from late September to late October.

Larvae of several NOCTUID MOTHS were of concern on alfalfa in some areas during 1970. VARIEGATED CUTWORM (*Peridroma saucia*) larvae first infested alfalfa in Bryan County, OKLAHOMA, in mid-May. By the third week of May, moderate to heavy numbers of late instars damaged alfalfa in the southwestern, south-central, central, east-central, north-central, and northeastern areas. Pupation began in

Noble County the last week of May, but damage continued through early June in most areas. Variegated cutworm was economic on alfalfa in Logan and Carroll Counties, ARKANSAS.

FALL ARMYWORM (Spodoptera frugiperda) was moderate to heavy and damaging in Jackson, Harmon, Stephens, and Craig Counties, OKLAHOMA, during late September and early October.

BEET ARMYWORM (Spodoptera exigua) infested most alfalfa in CALIFORNIA to some degree, and was troublesome on this crop in ARIZONA. Infestations were heavy in Jackson County, OKLAHOMA, in late September, but most larvae died of disease.

WESTERN YELLOWSTRIPED ARMYWORM (Spodoptera praefica) caused limited damage to seed alfalfa in UTAH, and damaged alfalfa at Pasadena in Elmore County, IDAHO, in late September and early October.

CABBAGE LOOPER (Trichoplusia ni) was heavy on alfalfa in Tillman County, OKLAHOMA, in late October, and SOYBEAN LOOPER (Pseudoplusia includens) was heavy in Jackson and Tillman Counties from late September to late October.

The heavy populations of ZEBRA CATERPILLAR (Ceramica picta) that damaged alfalfa hay in Lyon County, NEVADA, the past 2 years, failed to develop during 1970 and no infestations were reported. REDBACKED CUTWORM (Euxoa ochrogaster) was a serious pest of several crops in WASHINGTON. Larvae severely damaged 200 acres of seed alfalfa near Othello, Adams County, where applications of several pesticides gave poor control. In NEW MEXICO, Agrotis venerabilis larvae ranged up to 30 per square foot and denuded alfalfa at Hagerman and Dexter, Chaves County, during March and April. Controls were difficult.

WEBWORMS (Loxostege spp.) were heavy in Mayes and Nowata Counties, OKLAHOMA, in late June, in Payne County in early August, in Washita County on clover in late September, and in Stephens County in early October. Webworms were of minor importance on alfalfa in KANSAS during 1970 as in 1969. About 4,700 acres were treated.

REDLEGGED GRASSHOPPER (Melanoplus femurrubrum) was apparently increasing in WISCONSIN and during late summer, emphasis was placed on evaluation of the situation. Populations ranged 10-30 per square yard, but there was much variation between fields. Some crop damage was noted, but except in some portions of the central sands area, damage was light. However, in Marquette County some alfalfa was nearly stripped of leaves. A grasshopper, probably redlegged grasshopper, was abundant and troublesome during late summer in OHIO. Nymphal feeding damage became serious in northeastern areas in mid-July, and controls were considered. Damage was heaviest on alfalfa and clover; however, some damage was also noted on soybeans, corn, and grasses. Adult populations peaked early in September, and egg laying began. Another grasshopper Opeia obscura was reported from NEVADA for the first time. Specimens were collected during 1969.

GARDEN FLEAHOPPER (Halticus bractatus) counts per 100 sweeps of alfalfa in INDIANA averaged 145 in southern district by mid-August, and 219 in the northern district (550 in north-central) by September 2. Garden fleahopper populations in MARYLAND on alfalfa and red clover were the heaviest of the past 5 years, and controls were needed in several isolated areas. Populations increased sharply in alfalfa and red clover throughout the State. Infestations ranged 2-8 per sweep by June 12, and by early July, increased to 15 per sweep in many fields in Montgomery, Prince Georges, Baltimore, Harford, Howard, and Frederick Counties. By the last of July, most alfalfa in these counties had averages of 3 per sweep and whitening foliage was evident. Populations ranged 100-200 per sweep on red clover in Kent and Queen Annes Counties during mid-July.

SPIDER MITES (*Tetranychus* spp.) in NEVADA were generally heavier on alfalfa hay and more widespread than in previous years. Controls were applied in southern Nye County in March and April. Heavy numbers damaged up to 40 percent of 2,000+ acres in Pershing County in July and made harvesting difficult. PACIFIC SPIDER MITE (*T. pacificus*) developed heavy numbers on seed alfalfa in Humboldt County from June through August, although less acreage was treated in 1970 than in 1969.

ALFALFA SEED CHALCID (*Bruchophagus roddi*) infestations in NEVADA remained at about the same level as in 1969 in the seed growing areas, except in Lander County. In this area populations increased due partly to the abandoned alfalfa in the area. Alfalfa seed chalcid was moderate to heavy in alfalfa seed in Harper and Alfalfa Counties, OKLAHOMA, in early September. Alfalfa seed chalcid caused about the normal seed loss in UTAH.

LEAFMINER FLIES (*Agromyza* spp.) continued to cause considerable economic loss to alfalfa in MASSACHUSETTS. Heaviest infestations occurred in mid-July. Alfalfa leaflets in one field in Hampshire County were 59.7 percent infested. Infestation levels dropped in August and September to subeconomic in most fields in Hampshire and Berkshire Counties.

WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) was heavy and caused heavy damage to buds and leaves of alfalfa hay in Clark County, NEVADA, during late March and early April, and in southern Nye County during May. Unspecified THRIPS were reported to have caused poor seed setting in seed alfalfa in Barton County, KANSAS. About 2,000 acres of alfalfa were treated.

SOYBEANS

Highlights:

BEAN LEAF BEETLE was heavy in Alabama and Minnesota. MEXICAN BEAN BEETLE was a serious pest in Maryland, Virginia, and Alabama. SOYBEAN LOOPER was damaging in Arkansas and heavy in Oklahoma. VELVETBEAN CATERPILLAR was heavy in Florida and Alabama. TWOSPOTTED SPIDER MITE reduced yields in New Jersey.

BEAN LEAF BEETLE (*Cerotoma trifurcata*) was again heavy in several Black Belt counties of ALABAMA, especially in Greene, Sumter, and Marengo Counties where 10-25 percent of the leaves were destroyed in some fields. Damage in NORTH CAROLINA was generally lighter in 1970 than 1969, but it was the most abundant pest on soybeans in 1970. In MARYLAND, adults were active the first week of June and ranged 2-3 per row yard in Talbot, Wicomico, Somerset, Prince Georges, and Queen Annes Counties. Numbers remained stable throughout the season and rarely exceeded 5 per row yard. No controls were applied. Adults in INDIANA were more numerous and more widespread than in 1969. It damaged few central district fields at the end of May, but was otherwise seldom numerous enough to be economic. In MINNESOTA five adults per row foot in Yellow Medicine and Redwood Counties damaged 75-90 percent of the leaves during August. This is not considered serious that time of the year. Growers were concerned but damage was not important. No pod feeding was observed. Some pod damage in scattered fields in Dodge and Burt Counties, NEBRASKA, during September resulted in 1 percent loss in the fields examined. Damage was not economic in KANSAS. Some heavy infestations occurred in a few fields in the southeastern district with a high of 16.3 per row foot in a Neosho County field.

MEXICAN BEAN BEETLE (*Epilachna varivestis*) in INDIANA was confined to the usual south-central and southeast districts, was less widespread, and slightly less severe than in 1969. Damage in MARYLAND became economic about the second week of July; adults ranged 1-3 per row yard near Girdletree, Worcester County. Moderate to heavy numbers with 40-80 percent defoliation were restricted to Somerset, Worcester, and Wicomico Counties. About 1,200 acres in these counties required controls from July to September. In Accomack and Northampton Counties, VIRGINIA, defoliation ranged 50-100 percent in many fields by July 15. Early defoliation and dry weather resulted in 50 percent reduction in many fields with 10-15 bushels per acre common. Populations increased late in the season after a slow start in the Tidewater section. Many fields in Middlesex, Lancaster, Richmond, Gloucester, New Kent, and Nansemond Counties needed treatment by September 9. Since damage occurred late in the season, it is difficult to assess crop reduction due to defoliators in the Tidewater area. Those beans in maturity groups 5, 6, and 7 were most heavily damaged. Counts in NORTH CAROLINA were again generally subeconomic. This pest was very light in SOUTH CAROLINA. Mexican bean beetle was serious in a few isolated fields in southwestern ALABAMA, but numbers were lighter in most fields statewide. Counts in FLORIDA were light at Jay, Santa Rosa County, and in several other areas including Quincy, Gadsden County, and Gainesville, Alachua County. This pest caused some damage in commercial fields at Jay during July.

Specimens of a CERAMBYCID BEETLE (*Dectes sayi*) were collected in Tipton County, TENNESSEE, for a new State record, and in Madison County for a new county record. *D. texanus texanus* occurs over most of the Coastal Plain of NORTH CAROLINA. Specimens were collected in Franklin, Johnston, Sampson, and Halifax Counties. The greatest damage, up to 30 percent lodging, occurred in Washington, Beaufort, and Hyde Counties where land had been cleared for soybean cultivation.

SOYBEAN LOOPER (*Pseudoplusia includens*) was spotty and usually light to medium in FLORIDA. It was infected late in the season by *Spicaria rileyi* (a fungus). *P. includens* was very light in SOUTH CAROLINA. Numbers of *P. includens*, the predominant species, along with CABBAGE LOOPER (*Trichoplusia ni*) in ALABAMA was probably damaging in the coastal counties and less so in central and northern areas. *P. includens* has been a minor pest in ARKANSAS since 1969 when the first economic infestation occurred. Larvae this year mainly damaged several hundred acres of the Davis soybean variety in Jefferson County. No controls were applied because this species is highly resistant to available insecticides. Heavy numbers of *P. includens* defoliated soybeans in Jackson and Grady Counties, OKLAHOMA, during late September and early October. *T. ni* was heavy in Bryan and Jackson Counties during late September.

VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) was heavy and widespread after soybeans bloomed in FLORIDA. This pest caused heavy shedding of pods and complete defoliation in several acres of untreated soybeans at Quincy, Gadsden County, during September. Larvae were heavily infested late in the season by *Spicaria rileyi* (a fungus). *A. gemmatalis* was very light in SOUTH CAROLINA. Larvae infested numerous but isolated fields in coastal ALABAMA, with heaviest infestations in the extreme southwest. This pest occurred northward into Dallas, Montgomery, and Lee Counties, but was not serious.

GREEN CLOVERWORM (*Plathypena scabra*) caused no economic damage in VIRGINIA, and was very light in SOUTH CAROLINA. Larvae were generally light to moderate and somewhat spotty in FLORIDA. Larvae and other leaf feeders ragged leaves throughout ALABAMA, but the extent of damage was questionable. Green cloverworm was insignificant in KANSAS. About 1,250 acres, all in Crawford and Neosho Counties, were treated.

BEET ARMYWORM (*Spodoptera exigua*) was widespread, particularly in the middle and lower parts of SOUTH CAROLINA. Localized infestations were damaging and very difficult to control. Larvae were collected in Robeson County, NORTH CAROLINA, for a new State record.

LESSER CORNSTALK BORER (*Elasmopalpus lignosellus*) larvae are often a serious problem in FLORIDA, but damage was light to extremely light in 1970. *E. lignosellus* in SOUTH CAROLINA was locally very destructive. Increases were probably linked with dry weather during May, June, and July. In ALABAMA, *E. lignosellus* seriously damaged young stands in a few southern fields. First reports were received from Houston County on July 2. WEBWORMS (*Loxostege* spp.) damaged young soybeans in Tulsa and Mayes Counties, OKLAHOMA, during early July. Larvae fed mostly on the stems at or below ground level.

GREEN STINK BUG (*Acrosternum hilare*) appeared in northeastern OKLAHOMA during mid-August. Nymphs and adults of BROWN STINK BUG (*Euschistus servus*) and SOUTHERN GREEN STINK BUG (*Nezara viridula*) became pests after pod development in coastal ALABAMA although they occurred throughout the State. Damage was less than in 1969. Generally light to medium, *N. viridula* damaged some pods in FLORIDA. In VIRGINIA, subeconomic numbers of *A. hilare* were detected in King and Queen, Richmond, Lancaster, Middlesex, Gloucester, New Kent, Nottoway, and Amelia Counties during early September.

THRIPS were heavy in MARYLAND only in isolated areas on the Eastern Shore and in the southern area. Heaviest counts ranged 2-4 per leaf in Caroline, Talbot, and Prince Georges Counties during June. Silvering there in 6 to 8-inch soybeans occurred in several fields. About 700 acres required early season controls. By mid-July natural factors reduced numbers.

GRASSHOPPERS (*Melanoplus* spp.) numbers in ILLINOIS reached the highest level in several years. Damage to marginal rows was common in central and southern areas; occasionally, entire fields required treatment. About 69,200 acres were treated. Good growing conditions and lush grass in fencerows and along roadsides provided ample food and slowed migrations into soybeans and corn and thereby averted serious crop damage. Some problems are expected in 1971 in the central and southern areas where fall counts indicated several counties with threatening numbers. Hot, dry weather during egg hatch in June will favor the survival of spring nymphs.

TWOSPOTTED SPIDER MITE (*Tetranychus urticae*) in NEW JERSEY seriously defoliated several fields in Middlesex County by September 1. Yield loss in one soybean field was about 25 percent. STRAWBERRY SPIDER MITE (*T. turkestani*) in MARYLAND was the lightest within the past several years. Heavy midsummer rains did not favor buildups.

PEANUTS

LESSER CORNSTALK BORER (*Elasmopalpus lignosellus*) was generally light throughout most peanut areas of TEXAS. Counts ranged medium to heavy in Denton County during August and were light in other north-central areas. Populations were light to moderate in Marshall, Bryan, Hughes, and Caddo Counties, OKLAHOMA, from early July to late September. Damage was scattered in SOUTH CAROLINA.

REDNECKED PEANUTWORM (*Stegasta bosqueella*) became important in ARKANSAS due to an increase in peanut acreage. Less than 500 of 4,000 acres were treated. Infestations, generally less than one larva per plant terminal, were noneconomic. Moderate to heavy numbers in OKLAHOMA infested 75 percent of the terminals in Lincoln County during late June.

GRANULATE CUTWORM (*Feltia subterranea*) fed on some peanuts in FLORIDA. Damage was light in a field at Quincy, Gadsden County, during early July. Granulate cutworm was a pest in many fields in southeastern ALABAMA. About 70 percent of the 189,000 acres grown in the State were treated. Control was difficult.

SPOTTED CUCUMBER BEETLE (*Diabrotica undecimpunctata howardi*) populations in NORTH CAROLINA decreased one-third from those found in 1969. Damage in VIRGINIA was light and scattered in the peanut belt. Adults were plentiful as early as the third week of July, but severe larval damage did not occur.

THRIPS (*Frankliniella* spp.) were moderate in Okmulgee County, OKLAHOMA, during early July. TOBACCO THRIPS (*F. fusca*) damage was trace in SOUTH CAROLINA. *F. fusca* was a major problem throughout NORTH CAROLINA; 95 percent of the growers applied an organic phosphate at planting. Moderate to severe numbers of unspecified THRIPS in VIRGINIA injured peanuts in Prince George, Nansemond, Southampton, and Isle of Wight Counties during early July. Dry weather then rendered systemic insecticides ineffective. Wet weather in mid-July diminished the thrips problem.

A BURROWING STINK BUG (Pangaeus bilineatus) ranged light to heavy on peanuts in Frio County, TEXAS. A SPIDER MITE (Tetranychus sp.) damaged peanuts in OKLAHOMA at Perkins, Payne County, during August. TWOSPOTTED SPIDER MITE (T. urticae) was very damaging and difficult to control with registered materials in SOUTH CAROLINA.

COTTON

Highlights:

BOLL WEEVIL and BOLLWORM continued to be the major pests of cotton in most cotton producing States in 1970. In much of the Deep South, boll weevil populations were fewer than during 1969 and controls were effective in most cases. Populations of bollworm and TOBACCO BUDWORM were troublesome in several Southern and Southwestern States. Several NOCTUID MOTHS were of concern throughout the cotton growing States. THRIPS were damaging in Texas.

BOLL WEEVIL (Anthonomus grandis) populations were increasing in late June in south and south-central TEXAS. Populations were light statewide during mid-July, with the exception of the south-central areas where controls were applied in many cases. Frequent rain showers aided in the buildup in the south-central and Coastal Bend areas during late July and early August. Weevil infestations increased in several counties below the Caprock near Lubbock in early August, and in the Rolling Plains during the middle of August. Several boll weevil diapause control programs were again carried out in the Coastal Bend area of Texas during 1970. Boll weevil adults appeared in Jackson and Kiowa Counties, OKLAHOMA, the last week of May, and in Payne County in late June. Counts were generally light during June and July statewide, but ranged moderate to heavy in the southeastern, south-central, southwestern, and west-central counties during August. Infestations continued through October in the southwestern area and probably produced large overwintering populations in favorable areas. Boll weevil and Heliothis zea (bollworm) are the major cotton pests in ARKANSAS. Treatment for these pests increased from on fewer than 1 percent of the cotton before late July to on 10 percent. Controls continued to increase as the season progressed and a high of 77 percent of the cotton fields were treated in early September. Boll weevil control was effective; however, yields were reduced in northeast Arkansas due to no treatments. Boll weevil was first reported in MISSISSIPPI in mid-June. Highest peaks occurred in late August, but weevils were still present on green cotton in early October. Losses to cotton in the delta region and the northeastern sections of Mississippi were not as great as in 1969; however, loss is estimated at $28,000,000.

Spring surveys indicated the overwintered boll weevil population in ALABAMA was lighter than from 1966 to 1969. Early infestations were light, especially in the upper central areas and all of northern Alabama. Favorable weather permitted sizeable populations to develop at each generation. Controls were necessary during late June and early July in the southern and central areas. In northern areas, damaging numbers developed during the second and third generations. About 4 applications of insecticide were made statewide compared with 7 and 9 in 1969. Most cotton was well advanced before boll weevil problems developed and the yield is expected to be the fifth highest on record. Spring survival counts in SOUTH CAROLINA were the lightest since 1940. Late season control efforts in 1969 and extremely low temperatures during the winter of 1969-1970 were probable factors in reduced carryover. Populations were extremely slow to develop during the 1970 season. Controls were not applied in some Piedmont areas. Boll weevil did develop in Coastal Plain areas late in the season and controls were necessary. Weevil migration was delayed or did not develop in South Carolina. Overwintered boll weevils in NORTH CAROLINA were the lightest in recorded history for most sections. Damaging infestations did not develop until late July or early August, and most cotton was mature by this time. Boll weevil reduced yields in the most severe infestation by 25 percent. Heaviest counts occurred in Scotland, Robeson, Hoke, Anson, and Union Counties. The first boll weevil adults of the season in TENNESSEE were found feeding on terminal buds in McNairy County the first week in June. No increase was noted until the last week of June when adults were found feeding on terminal buds of cotton in 7 western counties. No egg laying punctures had been found at this time. First-generation weevils began appearing in older cotton during the third week of July. Infestations remained spotted. The first generation "hatchout" peaked the week ending July 24, and many fields in the regularly infested area were above control levels. Punctured squares averaged 12 percent the week ending July 31. Second-generation weevils peaked the second week of August and punctured squares ranged 4-78 percent. Conditions were ideal at this time for further buildup. During the third week of August, migration to uninfested areas of Tennessee was observed. Small bolls were damaged in the southern tier of counties. Punctured squares ranged 10-94 percent. Due to weather conditions and rank cotton, control was difficult. During the last week of August and through September, small boll damage was heavy where squares were scarce. Early cotton was no longer attractive to boll weevils and damage occurred in late rank cotton. Controls were effective when applied properly.

For Boll Weevil in the Texas High Plains and in the Southwest see CEIR 21(10):113.

BOLLWORM (Heliothis zea) moth flights in NORTH CAROLINA were heavy into cotton during late July in Scotland, Robeson, Hoke, and Union Counties, and during the first half of August in Johnston, Nash, Edgecombe, and Halifax Counties. Eggs and larvae were sufficient in most southern area fields by August 1 to warrant controls. In middle and northern counties, H. zea larval counts reached economic levels during the second week of August and remained high until the second week of September. Losses due to bollworm were light, primarily due to the crop maturing earlier than in previous years. Losses up to 30 percent were observed in improperly treated fields. TOBACCO BUDWORM (H. virescens) was light in North Carolina during 1970. In TENNESSEE, a few H. zea eggs were found in terminals in early June. By June 12, eggs and larvae were in older terminal buds. This was unusual for this time of year. Up to half-inch larvae were reported numerous throughout the cotton growing area, and many fields were above control levels. Egg and larval counts declined during the week ending July 17; however, most fields continued to be above control levels and controls were used in many areas. H. zea continued to cause considerable damage during July and into August. By late August, only late rank cotton was still attractive to the moths. Damage to late cotton continued through September in Tennessee. Controls were difficult to apply and in many instances were ineffective. Bollworm and tobacco budworm have become the major pests of cotton in SOUTH CAROLINA during the past 10 years. There has been much progress in delaying early chemical applications to give beneficial insects an opportunity to suppress populations. In some areas, such as the upper Piedmont, where no early or midseason applications were made, bollworms built up, heavy damage occurred in many fields, and populations became uncontrollable. Bollworm and tobacco budworm were major pests of cotton throughout ALABAMA following a buildup of two or more generations on clovers, vetch, and corn. Infestations and damage were much less than in 1969. Heavy infestations of Heliothis spp. were noted as early as June 5 in MISSISSIPPI. Peaks were reached in late August and were still present on green cotton in early September. Loss to cotton due to Heliothis spp. is estimated at $10,000,000.

Bollworms and boll weevil are the major pests of cotton in ARKANSAS. Control measures are interrelated. Fewer than 1 percent of the fields were treated for these pests prior to late July when 10 percent were treated. Treatments increased as the season advanced to a high of 77 percent in early September. H. zea is much more prevalent than H. virescens. Of 7,756 Heliothis larvae collected from cotton, 445 or 5.7 percent were determined H. virescens. In OKLAHOMA, H. zea larvae were noted from mid-July in the southwestern area into early October in most areas. Eggs and damaged squares seldom averaged over 15 percent in most areas, but counts were heavy in scattered areas in Bryan and Marshall Counties during September. H. virescens occurred only in Grady County, where larvae comprised 50-60 percent of the bollworm populations during the second half of September and early October. Populations of H. zea and H. virescens increased in early June in south TEXAS. H. virescens larvae were found in heavy populations in

Cameron County and caused considerable damage to cotton during mid-July. Increased H. zea activity was noted late in July throughout Texas. Infestations were heaviest in the Trans-Pecos area and in Collin, Grayson, and Ellis Counties in the Blacklands. Increased H. virescens populations were noted in the College Station (Brazos County) and Waco (McLennan County) areas on August 4. Very few fields required treatment for H. zea in NEW MEXICO. Most damage to cotton by H. zea in ARIZONA occurred after September 1. Although larvae were found on young cotton in early June, most infestations were eliminated. Many growers in Cochise, Graham, Maricopa, Pima, Pinal, and Yuma Counties maintained regular spray programs, or subscribed to some type of field checking service.

BEET ARMYWORM (Spodoptera exigua) larvae were very damaging to young cotton and to older cotton late in the season in CALIFORNIA. Larvae were troublesome on cotton seedlings in Yuma County, ARIZONA, and controls were required. Beet armyworm appeared in SOUTH CAROLINA about mid-July and began feeding on cotton and other hosts. The initial buildup probably occurred on pigweed. Larval damage was heavy locally in some areas of the Coastal Plain.

CABBAGE LOOPER (Trichoplusia ni) larvae were heavy in many fields in the Salt River Valley of Maricopa County, ARIZONA, from mid-August through September. Heavy rains in early September helped reduce many potential infestations. Cabbage looper larvae damaged cotton in Jackson and Marshall Counties, OKLAHOMA, during September. SOYBEAN LOOPER (Pseudoplusia includens) damaged scattered fields in Grady County, Oklahoma, during early October. Cabbage looper infestations in SOUTH CAROLINA were about normal for the year. No controls were applied. Naturally occurring viruses and fungi reduced cabbage looper populations in most fields. Naturally occurring pathogens also kept cabbage looper below economic levels in NORTH CAROLINA. A nuclear polyhedrosis virus and Spicaria rileyi (a fungus) were primarily responsible.

SPIDER MITES were a problem on cotton in several areas. TWOSPOTTED SPIDER MITE (Tetranychus urticae) has become the predominant spider mite on cotton in SOUTH CAROLINA. In past years spider mites were mainly pests of maturing cotton, but in recent years they have infested cotton from the seedling stage to harvest. Failure of growers to destroy early season hosts adjacent to cotton and reduction of field populations of predators and parasites have contributed to continued trouble. Where systemic insecticides are used at planting, growers appear to have fewer spider mite problems on seedlings. Unusually high counts of Tetranychus spp. occurred in local areas of Scotland and Robeson Counties, NORTH CAROLINA, during early and midseason. Infestations also developed in Halifax and Northampton Counties. Tetranychus spp. occurred in local areas of Scotland and Robeson Counties, NORTH CAROLINA, during early and midseason. Infestations also developed in Halifax and Northampton Counties. Tetranychus spp. stunted plants most severely on the periphery of fields. Only a few fields needed controls. Spider mite infestations in TENNESSEE were spotty during the week ending June 10 with heavy infestations in some isolated fields. Damage continued during July and August. Controls were effective when properly applied. In NEVADA, Tetranychus spp., required control on about 200 acres in Nye County in June, July, and August.

TARNISHED PLANT BUG (Lygus lineolaris) damage was light to pinhead squares during June, July, and August in TENNESSEE. Infestations were not at levels to warrant control for this species alone. CLOUDED PLANT BUG (Neurocolpus nubilus) adults were collected from blooms and squares in a large cotton field in Colbert County, ALABAMA, August 18. This was the first report of this pest in the State. COTTON FLEAHOPPER (Pseudatomoscelis seriatus) populations began to cause concern in south TEXAS in early June. Infestations were heavy and a major problem in central Texas and in the Blacklands area during late July. Counts of up to 125 per 100 terminals were reported in many fields. Infestations of cotton fleahopper were found in southeastern, south-central, southwestern, central, east-central, and north-central, OKLAHOMA, from early June through mid-August. Counts were heavy in most southwestern and west-central counties during mid-July, partly because dry weather made native hosts unattractive. Counts ranged moderate to heavy in Coal County during mid-August. Lygus sp. required controls on about 200 acres in Nye County, NEVADA, in July and August.

THRIPS were a problem on cotton in some areas, but mostly early in the season. Thrips were a major problem in the Rolling Plains, South Plains, and Trans-Pecos regions of TEXAS during June. Populations were light to heavy but decreased toward late June. *Frankliniella* spp. were usually light in southwestern and south-central, OKLAHOMA, from mid-May to mid-July. TOBACCO THRIPS (*F. fusca*) and FLOWER THRIPS (*F. tritici*) occurred on cotton statewide in ALABAMA, especially when plants were in the 2 to 6-leaf stage. Controls consisted mostly of preplant systemics. tobacco thrips was not the problem it once was in SOUTH CAROLINA due to the widespread use of treated seed and systemic insecticides. Seedlings outgrew damage. Thrips and damage were light during the third week of May in TENNESSEE. Populations were moderate to heavy during the fourth week of May and damage was apparent. Thrips migrated during the first and second weeks of June from early cotton to late cotton, and damage was light to heavy. By mid to late June, all cotton was past thrips damage.

COTTON APHID (*Aphis gossypii*) ranged 1-50 per plant on 2 to 4-leaf cotton throughout ALABAMA. Large numbers of *Hippodamia convergens* (convergent lady beetle) and other predators were also present and controlled aphid infestations in 10-20 days. There was some discoloration of lint in isolated fields late in the season due to sooty mold on honeydew residues deposited by aphids feeding on top leaves. Cotton aphid caused very light damage to cotton seedlings in SOUTH CAROLINA.

TOBACCO

TOBACCO FLEA BEETLE (*Epitrix hirtipennis*) numbers and damage were light in FLORIDA. Field populations in SOUTH CAROLINA were believed to have been heavier than in recent years. In VIRGINIA, adults lightly damaged tobacco in plant beds and newly set plants during May in the tobacco belt--Pittsylvania County and surrounding counties. By September 9 several fields in Prince Edward County showed light to moderate numbers of holes in the leaves. Economic damage was very light due to effective spray practices. In MARYLAND it was first active May 22 in St. Marys County. Counts on newly set tobacco ranged 1-6 per plant during June. Heavy summer rains promoted good tobacco growth and minimized injury from June to August. No field sprays were applied.

TOBACCO WIREWORM (*Conoderus vespertinus*) and SOUTHERN POTATO WIREWORM (*C. falli*) were very light in FLORIDA. *C. vespertinus* infestations in many of the problem fields in SOUTH CAROLINA are believed to have been markedly reduced during 1970.

CUTWORMS, mostly GRANULATE CUTWORM (*Feltia subterranea*), were light in FLORIDA and not a problem as in 1969. CABBAGE LOOPER (*Trichoplusia ni*) was moderate, but damage was light in the State. Light in the field, POTATO TUBERWORM (*Phthorimaea operculella*) in Florida was mostly a problem in hybrid seed production in greenhouses. In MARYLAND an unusually heavy infestation of *P. operculella* damaged 50 percent of a 2-acre stand near Galesville, Anne Arundel County. One acre needed replanting.

GREEN PEACH APHID (*Myzus persicae*) was heavy during spring in untreated beds of shade-grown tobacco in FLORIDA. Damage was light in SOUTH CAROLINA. In MARYLAND it infested tobacco in early July. Infested plants ranged 1-10 per 50 plants in Charles, St. Marys, Calvert, Anne Arundel, and Prince Georges Counties. Remaining light throughout the season, this aphid rarely infested over 30 percent of a field throughout southern Maryland. Systemics applied before planting gave good season control.

MOLE CRICKETS (*Scapteriscus* spp.) caused some damage in shade-grown tobacco plant beds at Quincy, Gadsden County, FLORIDA.

SUGAR BEETS

Highlights:

Control of SUGARBEET ROOT MAGGOT was effective in Idaho but not in Wyoming in many cases. BEET ARMYWORM was more of a pest than usual in California. BEET WEBWORM was much heavier in Wyoming. Due to SUGARBEET ROOT APHID, producing good sugar beets in Arizona was difficult.

SUGARBEET ROOT MAGGOT (Tetanops myopaeformis) adults emerged May 15 in south-central IDAHO and peaked in Gooding, Jerome, Lincoln, Twin Falls, Cassia, and Minidoka Counties during late May and early June. Damage was minimized by soil insecticides at planting and by cold, wet weather during adult activity. Larvae ranged from zero with the best treatments to 35 per beet with no treatments. Root maggots were present in Bannock, Bingham, Bonneville, Caribou, Cassia, Franklin, Gooding, Jerome, Lincoln, Madison, Minidoka, Oneida, Power, and Twin Falls Counties. Adults, but no damage, were observed in UTAH. Damage in COLORADO ranged from light to heavy in the sugar-beet growing areas of Larimer, Weld, and Boulder Counties. Adults emerged during early May and peaked in late May. Overall loss was light, with the heaviest damage in more recently infested areas.

Sugarbeet root maggot adults in WYOMING appeared in Park and Big Horn Counties during mid-May and peaked about June 5. Hatch began about mid-June. Counts were much higher in 1970 with about 25,350 acres infested. Controls were not effective in many cases. Maggots in NORTH DAKOTA were 0.5-3.0 inches deep in old fields the first week of May. By May 22, some adults had emerged. By June 5, about 70 percent of the maggots had pupated. By June 8 the first eggs of the season were seen and adult controls were started. By June 26, adults and eggs were present in most new fields and eggs had hatched. Fly emergence was completed. By mid-September, up to 42 (averaged 4) maggots per plant were 3-7 inches deep. Numbers declined from 1969. About 24,000 acres were infested. Controls were applied to over 19,000 acres. Present controls have been erratic.

SPINACH LEAFMINER (Pegomya hyoscyami) occurred during May and June in northeastern COLORADO, but damage was very light overall. Counts in WYOMING were low throughout the season.

BEET ARMYWORM (Spodoptera exigua) was probably more of a pest than in the past in CALIFORNIA. S. exigua damaged seedlings in Maricopa and Pinal Counties, ARIZONA. Sugar beets recovered better than lettuce. ZEBRA CATERPILLAR (Ceramica picta) and S. exigua were light in COLORADO. BEET WEBWORM (Loxostege sticticalis) occurred in Colorado during May and June; overall damage was light. Larvae were light in most fields during June and July. Counts in Otero County were less than 20 per 100 sweeps. L. sticticalis in WYOMING was much heavier than in 1969. Damage occurred in Fremont, Platte, Park, Big Horn, and Washakie Counties. Larvae were first noted in Park County June 9. Counts peaked the last week of June. Infestations were scattered and variable. Many fields were treated. Second-brood larvae caused some damage in Washakie County; many fields were sprayed twice.

A WEEVIL (Cosmobaris americana) in WASHINGTON was found on a new host, sugar beets, near Grandview, Yakima County. Active in late May, larvae and adults of a CARRION BEETLE (Silpha bituberosa) damaged some fields in Hot Springs, Park, and Washakie Counties, WYOMING. Control results were good. Some fields were replanted. Shotholes by WESTERN BLACK FLEA BEETLE (Phyllotreta pusilla) in NORTH DAKOTA ranged 1-8 per leaf on up to all of the plants in scattered fields in Walsh, Pembina, and McKenzie Counties by mid-June. Unspecified WIREWORMS, up to 12 per plant, damaged sugar beets in Pembina County, North Dakota. Wireworms in MICHIGAN damaged a few fields, an unusual occurrence.

POTATO APHID (*Macrosiphum euphorbiae*) built up heavily in the Yakima Valley, Yakima County, WASHINGTON. GREEN PEACH APHID (*Myzus persicae*), increasing slowly in Washington, reached heavy numbers by mid to late season. *M. persicae* was a general pest in several CALIFORNIA locations. In UTAH, *M. persicae* was the most common species to infest sugar beets. BEAN APHID (*Aphis fabae*) was light in seed fields in Washington County, Utah, during spring. SUGARBEET ROOT APHID (*Pemphigus populivenae*) made production of good sugar beets very difficult in some ARIZONA areas. BEET LEAFHOPPER (*Circulifer tenellus*) and CLOVER LEAFHOPPER (*Aceratagallia sanguinolenta*) in COLORADO were in most fields in low numbers.

SAY STINK BUG (*Chlorochroa sayi*) and a smaller STINK BUG (*Thyanta rugulosa*) were light in several fields in Prowers County, COLORADO. TARNISHED PLANT BUG (*Lygus lineolaris*) bronzed some leaves, an unusual occurrence, in MICHIGAN late in the season.

MISCELLANEOUS FIELD CROPS

VARIEGATED CUTWORM (*Peridroma saucia*) larvae became economic in some mint fields in the Willamette Valley of OREGON in July. Larval estimates ranged 87,000 to 283,000 per acre. BEET ARMYWORM (*Spodoptera exigua*) larvae in FLORIDA were damaging to young 6-inch tall kenaf plants in the Redlands area west of South Miami during early May. SUNFLOWER MOTH (*Homoeosoma electellum*) larvae were economic on an experimental planting of sunflowers at Brookings, Brookings County, in late May. Insecticides controlled the infestation.

Larvae of a FLEA BEETLE (*Longitarsus waterhousei*) damaged about 25 percent of 25 acres of peppermint by June in Clark County, WASHINGTON. STRAWBERRY ROOT WEEVIL (*Brachyrhinus ovatus*) infestations were sporadic on mint throughout OREGON.

A CECIDOMYIID MIDGE ("*Cecidomyia*" *texana*) was heavy in many counties of the Rolling Plains of TEXAS on guar. Infestations were heaviest in Knox and Haskell Counties where larval averages of 2 per bud were common. WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) populations were very numerous in sunflower blossoms in UTAH. GREEN PEACH APHID (*Myzus persicae*) and *Phorodon menthae* were heavy on peppermint in WASHINGTON near Othello, Adams County. Controls were applied often.

Weather of the week continued from page 160.

TEMPERATURE: Winter temperatures continued from the northern Great Plains to New England. Detroit Lakes, Minnesota, registered -20° Monday morning. Arctic air poured southward and freezing weather reached the gulf coast. New Orleans, Louisiana, recorded 28° Monday. As brisk northerly winds brought cool temperatures southward on the front side of a high, southerly breezes brought a warming trend to mid-America on the back side of the high. Oklahoma City, Oklahoma, registered 67° Monday afternoon. By Thursday, maximums over the Great Plains ranged from the 40's to the 50's in the Dakotas to the 60's in Kansas, the 70's in Oklahoma, and the 80's in much of Texas. Waco and Alice, Texas, registered 88° and 89° respectively Thursday afternoon. Maximums in the Far West ranged in general from the 40's in Washington to the 80's in southern California. Subfreezing temperatures occurred almost every morning over the Great Basin and Rocky Mountain States. As the weekend storm moved to the central Great Plains, southerly winds brought summer weather over the central and southern Great Plains. Gage, Oklahoma, registered 87° Saturday, when temperatures over much of Texas reached the 90's. McAllen, Texas, registered 101° Sunday afternoon. Weekly mean temperatures were above normal over most of the Nation. Main exceptions included the Far West, northeast from Wisconsin to New England, and southeast from Alabama to the Carolinas and Florida. Most of the Great Plains from Canda to the lower Rio Grande averaged 6° to 10° warmer than normal. (Summary supplied by Environmental Data Service, ESSA.)

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